THE EFFECT of RHETORICAL ORGANIZATION on the READABILITY of STUDY TEXTS

by

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ABSTRACT

Rhetoricians have traditionally claimed that the communicative effectiveness of a text can be increased if the writer adheres to certain relevant principles of organization. Up to now, however, there appears to have been little objective validation of this view. The aim of this study is to establish whether it is possible, by systematically varying selected features of overall textual organization, to affect the readability of a teaching text, i.e. a text primarily designed to impart factual information to students. In the context of this study, one text is considered to be more 'readable' than another if it results in the reader's gaining more content information from it without any corresponding increase in reading time.

The approach taken is an experimental one. Normally, two texts are prepared, as similar as possible to each other in content, length, and syntactic complexity, and differing in respect of some previously defined organizational feature. When two such texts have been prepared, their comparative readability is tested in experimental conditions. The tests used are primarily designed to measure speed of reading, and recall of content.

The organization features investigated here are restricted to inter-sentence or inter-clause relationships; no attempt is made to use larger 'units' such as paragraphs.

Preface

The purpose of this preface is to clarify the organization of the study.

Chapters 1 and 2 are introductory. Traditionally, readability has been defined in terms of sentence difficulty. Most psycholinguistic studies have also concentrated on subjects' processing of sentences. Chapter 1 provides a brief account of some of the more important aspects of work done on the readability of sentences.

Recently there has been a renewal of interest in the overall structure of texts, including the effect of such structure on comprehension. Chapter 2 examines some of this work, concentrating on those studies which appear to be related and relevant to the present study.

The main body of the study, from Chapter 3 onwards, is concerned with a series of experiments designed to test the effect on readability of varying the organization of texts in different ways. Chapter 3 summarizes the common elements of all the experiments, including types of test task used, levels of significance accepted, etc.

The experiments themselves fall into two main groups, according to the type of textual organization involved. The first general type of organization here includes Time and Space organization. Since some idea of time and space is presumably common to most human beings, and would appear to be at least partly independent of language, Time and Space organization are here described as controlled by

'natural' principles of organization, following Lackstrom, Selinker and Trimble (1972).

Narrative texts can be organized in such a way that the linear sequence of sentences or clauses corresponds to the sequence in time of the events described. On the other hand, this temporal sequencing of text units can be deviated from. Chapter 4 describes syntactic work on the effect on sentence meaning of different clause ordering, psycholinguistic studies of the effect of different ordering on the readability of sentences, and, finally, experiments in which the effect of temporal and non-temporal ordering on the readability of extended texts are compared.

Descriptive texts can describe a series of objects in such a way that the linear sequence of sentences or clauses corresponds to a linear ordering in space of the objects described. Chapter 5 describes experiments conducted to find out whether a descriptive text organized so as to correspond to a linear sequence of objects in space is more readable than one which deviated from such a sequence.

Both temporally and spatially ordered texts are organized according to commonly accepted principles largely independent of a particular speech situation. Other forms of organization relate to quite different types of principle. The relationship of Assertion-Exemplification, for instance, is imposed by the utterer upon two or more propositions. It depends on his view of the world, which may in this respect be quite idiosyncratic. Moreover, the function of such relationships is often to win acceptance of a speaker's message from

a particular audience. An exemplificatory propostion, for instance, often functions to clarify or substantiate a previous statement. Thus relationships of this sort are more purely rhetorical, and dependent on beliefs and attitudes in a speech situation, than are forms of organization related to 'natural' principles. Following Lackstrom, Selinker and Trimble, this second general type of organizational principles are referred to here as 'logical' principles.

Chapter 6 gives an account of the relationships employed in the second part of this study, and thus serves as an introduction to the following two chapters.

In Chapter 7 texts containing these relationships (here called 'hypotactic' texts) are compared for readability with texts lacking these relationships (here called 'paratactic' texts). In Chapter 8 hypotactic texts in which the relationships are overtly marked are contrasted for readability with texts in which the same relationships have been left unmarked.

Finally, Chapter 9 summarizes the significant experimental results, discusses some problems arising from the results, and proposes further research.

CONTENTS

CHAPTER 1.

THE COMPREHENSION OF SENTENCES.

This chapter contains an account of some of the work done on the comprehension, and relative difficulty, of individual sentences. The research described is sometimes concerned with the comprehension of written sentences, sometimes with the comprehension of spoken sentences. The view adopted here is that reading and listening are closely related language activities, and hence that it is unnecessary, at certain levels, to distinguish between them. This view is supported by Sticht's findings (Sticht, 1972) that there is a high correlation between reading and listening skills. Sticht argues that 'there do not exist two kinds of language comprehension, one for reading and one for listening; rather, there is only one, wholistic ability to comprehend by language' (p. 293). A similar position has been adopted in this chapter, and, in fact, throughout this study.

1.1. The Effect of Sentence Length: Readability formulae generally assess the readability of a text according to two main factors, the number of difficult words, and the length of the sentences. Words are considered difficult either because they are unusually long in terms of number of syllables, or because their overall frequency of occurrence in the language is low. Sentence length is calculated according to the number of words contained.

Such formulae are relatively successful in predicting the level of

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difficulty of existing texts. However, the assumption that sentence length is itself a factor causing difficulty has been queried by Schlesinger, among others, on the grounds that sentence length may correlate with other factors which may be the real causes of reading difficulty (Schlesinger, 1968: 71-73).

Schlesinger points out, for example, that a text composed of short sentences may contain more redundancy than an equivalent text with long sentences, and that lack of redundancy may cause difficulties. As another possibility, he suggests that difficult content may tend to be expressed in long sentences.

Schlesinger compared the readability of three texts, differing in sentence length, but containing the same content, ie. information. He found no correlation between sentence length and reading speed, and no significant difference between subjects' performance on comprehension questions between the three texts. He concluded that when the content of texts is held constant, sentence length has no effect on readability (p. 80).

Rothkopf (1972) has also queried the assumption that structural features such as sentence length are valid measures of readability. In an experiment conducted by himself, Smith and Koether, in which ten paraphrases were used, there was little correlation between structural features and subjects' learning. Rothkopf concludes that content is a more powerful factor in readability.

Rothkopf argues that when adults can proceed at their own pace, structural features such as sentence length have little effect on the amount of information they gain from a text. In an experiment, he used two texts containing the same content, but differing in readability

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indices, one being 'difficult', the other 'normal', together with two composite texts, each composed of half of the difficult version, and half of the normal version. There were thus 4 different texts, namely,

1. 1st half difficult; 2nd half difficult
2. 1st half difficult; 2nd half normal
3. 1st half normal; 2nd half normal
4. 1st half normal; 2nd half difficult.

Subjects were allowed to read the texts at their own speed. Subjects who read Text 2 read the second half more slowly than did subjects who read Text 3. Similarly, subjects who read Text 4 read the second half more slowly than subjects who read Text 1. Rothkopf concludes from this that readers adjust to difficulties, but that the adjustment is not 'finely tuned' (p. 322).

Whether this can be accepted as a valid criticism of readability measures is open to doubt. Since the only form of adjustment shown by Rothkopf's subjects was to slow down on difficult texts, and speed up on easier ones, then the readability indices would appear to be valid, since the speed at which a text can be read is surely a feature of its total readability.

1.2. The Effect of Syntactic Complexity: If sentence length is not a factor in readability, other factors must be looked for. An obvious possibility is the syntactic complexity of the sentences in a text. Schlesinger (1968), for example, initially adopted the hypothesis that syntactic complexity caused reading difficulties. In addition to his study, there is a large body of psycholinguistic work aimed at investigating the relative difficulty of different types of sentence,

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eg. Actives compared to Passives, and some of the findings will now be discussed.

1.2.1. Grammatical Model: Any investigation of the psychological effects of syntactic complexity requires to be based on a particular grammatical model, which will indicate which structures are syntactically more complex than others. Most of the experiments described below are based on the grammatical model described by Chomsky in 'Syntactic Structures' (Chomsky, 1957). This model consists in the main of a set of phrase structure rules, which generate kernel strings, and a set of Transformational rules which operate on these strings. Transformations are either optional or obligatory. If only obligatory transformations are applied, then the sentence generated corresponds to what would traditionally be referred to as a simple affirmative statement. Application of optional transformations results in Negative sentences, Questions, Passives, Passive Negatives, etc.

1.2.2. Psycholinguistic Experiments: George Miller (1962) appears to have been the first to conduct experiments based on the hypothesis that the linguistic structures and processes described by the transformational linguists have psychological reality. Miller found that left and centre branching constructions, eg. 'The cat the dog chased killed the rat', gave adult subjects to whom the sentences were read aloud great difficulties in recall tests. He explained the greater difficulty of such construction, as compared to right branching constructions, in terms of the greater strain the former impose on the short-term memory.

Miller also hypothesized that sentences which were the result of the

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application of one or more optional transformations should be more difficult than simple affirmative sentences, and that the application of a 'complex' transformation, such as the Passive, should result in sentences that were more difficult than those produced as a result of the application of a 'simple' transformation, such as the Negative. Subjects read sentences arranged in a left-hand column, applied particular transformations, and then had to find, in a right-hand column, sentences that corresponded to the results. Search and writing time were subtracted from total response time, and the remaining time was taken as representing the time spent performing a particular transformation. The results appeared to confirm the syntactic hypothesis. For example, Negatives took less time than Passives, and Passive Negatives took longer than both.

Miller suggested that sentences are remembered as kernels plus transformational 'footnotes'. The more footnotes that have to be remembered, the more difficult the sentence will be to recall in its original form.

Gough (1965) adopted this hypothesis in an experiment in which adult subjects had to verify a sentence in respect of a picture which they were shown after they had read the sentence. He found that Active sentences required less response time than Passives, Affirmatives less time than Negatives, and True sentences less time than False ones. Truth values interacted with the Affirmative/Negative variable; eg., response time for True Affirmatives was shorter than that for False Affirmatives, whereas the response times for True and False Negatives did not differ significantly. From this, Gough argued that a semantic factor was

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operating in the Affirmative/Negative results.

1.3. The Effect of Semantic Factors: Gough's suggestion that a semantic factor was operating was taken further by Slobin (1966). Like Gough, he had subjects, adults and children, verify sentences with respect to pictures. The pictures were of two kinds, 'reversible' and 'non-reversible'. In the first kind, the actor and object in the picture, eg. a dog (actor) chasing a cat (object) could be reversed in a sentence without the sentence being anomalous, ie. 'The cat is chasing the dog'. In non-reversible pictures, eg. a girl watering flowers, this could not be done. The sentence forms used were Kernels, Negatives, Passives and Passive Negatives.

Subjects' response times to these forms were found to be in the following order: K < P < N < PN. This order, which shows that Negatives took longer to decode than Passives, is evidence against the original syntactically-based hypothesis, which predicted that Negatives would require less time than Passives. Slobin concluded that 'semantic problems of negativity seem to outweigh the syntactic problems of passivity' (p. 223).

The presence of semantic factors receives more support from subjects' response time to reversible and non-reversible pictures. While in the case of reversible pictures, Active sentences were easier than Passives, this difference disappeared in the case of non-reversible pictures, eg., the sentence 'The girl is watering the flowers' proved no easier than the sentence, 'The flowers are being watered by the girl'. Slobin concluded that one of the main difficulties in Passive

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is the problem of keeping track of which noun is the actor, that is, it is a semantic problem, not a syntactic one. When this difficulty is removed, as in the case of the non-reversible pictures, the difference in difficulty between Active and Passive disappears.

In experiments specifically directed at discovering factors causing difficulty in written texts, Schlesinger (1968) also found that semantic factors seemed to outweigh syntactic ones. He compared the readability of texts containing the same content but differing in that one contained 3 degrees of embedding (ie. 3 parentheses nested one inside the other), 1 degree of embedding, or no embedding. The results showed that 3 degree nested texts took longer to read, but that there was no difference between 1 degree and 0 degree nested texts. He repeated the experiment using 2, 1, and 0-degree nested texts, and found there was no difference in readability between them. Texts with 3 degrees of nesting are comparatively rare in normal prose, and Schlesinger concluded that nesting had no effect on reading rate or comprehension.

Schlesinger argued that it was useless to attempt to separate syntax from semantics in the decoding process, since subjects could use semantic 'cues' to overcome syntactic difficulty. He compared the readability of nested sentences containing semantic cues with those not containing such cues. For example, if the sentence, 'The girl hit the boy' is embedded, the reader has no semantic cue to tell him who did perform the action, whereas he does have a cue in the case of 'The girl ate the banana'. The results of the experiment showed that cue sentences were much easier than non-cue sentences. In another experiment, Schlesinger found that degree of nesting had a significantly greater effect on

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readability in the case of non-cue sentences. Schlesinger concluded that 'content' may be the chief determiner of readability (p. 141).

1.4. Pragmatic Features Affecting Readability: In Slobin's experiment described above, he found that True Negatives took longer to respond to than False Negatives (Slobin, 1966). He explains this in terms of a pragmatic feature of 'matching' between picture and sentence. Given a picture of a dog chasing a cat, Slobin argues, subjects decode it in terms of 'Instigator of action (agent) + action + recipient of action', eg., 'Dog chasing cat'. When subjects are then presented with a False Negative sentence, 'The dog is not chasing the cat', they are able to 'match' the agent of the action in the picture and the subject of the sentence. On the other hand, in the case of the True Negative sentence, 'The cat is not chasing the dog', agent and subject of sentence do not match. Slobin suggests that mismatching creates difficulties.

This notion has been developed by Olson (1972), who argues that grammar is only one aspect of comprehension, and that sentences are comprehended relative to a context supplied either by the perceptual situation, or by preceding sentences in a text.

Olson examined the relative difficulty of Active and Passive sentences in a perceptual context. The subjects, children, were given pictures followed by sentences which they had to verify. Olson hypothesized that if they coded a picture in terms of 'agent', then they would subsequently find the Active sentence easier than the Passive, but that if they coded the picture in terms of 'recipient', then the Passive sentence would be easier. Subjects were induced to

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code pictures in terms of the recipient by being first shown a picture of a truck, for example, and asked to comment on it. They were then shown a picture of a car hitting the truck. When this was done, the Passive sentence, 'The truck was hit by the car' took less time to verify than the Active equivalent.

Pragmatic features affecting comprehension have also been investigated in an interesting series of experiments described by Bransford and Johnson (Bransford and Johnson, 1972). They emphasize that language is a symbol system and must be related to the knowledge of communicating subjects. They consider that semantic anomaly is 'largely a function of the degree to which one can relate a sentence to some relevant aspect of his knowledge of the world'(p. 17).

If sentences are comprehended by relating their content to a previously constructed knowledge structure, then semantic anomaly should arise when the subject has difficulty in generating a suitable context for a sentence. To prove this experimentally, sentences involving causal relationships were used. One group of subjects were given a mixture of 'hard' and 'easy' sentences, eg.,

hard: 'The notes were sour because the seam split'

easy: 'The account was low because she went to the bank'.

As predicted, the 'hard' sentences proved more difficult to recall than the 'easy' ones. A second group read the same set of sentences preceded by cues, in the case of the two sentences above, 'bagpipes' and 'withdrawal' respectively. The provision of cue words reduced the difference between hard and easy sentences.

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When sentences were preceded by either a good cue, a bad cue, or a dummy cue, then the good cue was most effective, the bad cue produced the worst recall results, and the dummy cue produced results between the two others. For example, in the sentence,

'The streak blocked the light'

the good cue 'window' was most effective in helping subjects, the dummy cue 'ready' was next, and the bad cue 'spider' was least effective.

However, although cues were effective with single sentences, they had no effect on the comprehension of extended texts. Thus, giving a false 'topic' in the form of a title, for example 'Reading a Magazine at Lunch', to a text dealing with 'The First Space Trip to the Moon' did not affect comprehension. Presumably a text is capable of generating its own context.

Finally, Bransford and Johnson produce some evidence that sentences in 'false' contexts become more difficult to read. When a sentence describing the landing of men on a planet was inserted in a text describing a peace march, subjects who read the text under the 'false' title 'Space Trip to an Inhabited Planet' recalled the intrusive sentence better than subjects who read the same text under the 'true' title, 'Peace March'. Bransford and Johnson conclude that 'potentially meaningful material can remain relatively incomprehensible when S's do not have prerequisite semantic information activated at the time of input' (p. 25).

1.5. Conclusion: It seems possible that syntactic complexity is not in itself a major factor in readability, but is outweighed by semantic and pragmatic factors in the communication context. Olson argues that a

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sentence is comprehended relative to a context, and that this context is specified 'either by a perceptual situation or by preceding sentences' (Olson, 1972: p. 140). In the latter case, the difficulty of a sentence may be affected by the text of which it forms a part, and thus, possibly, by the organization of that text, as is hypothesized in this study.

CHAPTER 2

DISCOURSE STRUCTURE AND THE COMPREHENSION OF TEXTS

2.1. The Need for Syntactic Information: It is commonly recognized that Intra-Sentence structure, ie. syntax, plays an important part in the comprehension process. Wardhaugh, for example, states that 'one does not understand sentences by adding together the meanings of words in the same way that beads are added together on a string to make a necklace.' (Wardhaugh, 1969: p. 86).

The deficiencies of a method that ignores syntax can be shown by reference to the use of frequency counts to measure the 'content' of a message. Content analysts, for example, have on occasion used such counts as a means of assessing the sender's 'interest' or 'attention', ie. what the sender is particularly interested in communicating. Thus Osgood argues that 'the greater the source's interest in a given topic, the greater will be the relative frequency with which lexical items associated with this topic are produced.' (Osgood, 1959: 37). It is not clear, of course, that this argument is valid. It has been criticized by A. L. George (1959) on the grounds that there is no theory capable of predicting how given values will be expressed by means of particular symbols. It is, however, unquestionably the case that the method can be made to yield better results if a certain amount of syntactic information is used in the analytical process. Gopnik, for example, (1972), whose method of analysing texts involves a 'normalization' procedure by which, among other things, zeroed and pronominalized items are restored, points

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out that one of the texts she analysed contained initially two occurrences of the lexical item 'bird'. After the normalization procedure, there were 36 such occurrences. Gopnik concludes that normalized texts, ie. those in which syntactic information has been used to restore deleted items, are more suitable than actual texts when frequency counts are being used to establish the semantic content of a text (pp. 105-6).

2.2. Limitations of a Sentence-Restricted Analysis: While the importance of syntax has been recognized for a long time, the necessity of taking extra-sentential relationships into account has not, until recently, been given due importance, at least in linguistically based models of comprehension. The extreme limitations of using a form of analysis limited to intra-sentential relationships will here be demonstrated by reference to Osgood's analysis of 'evaluative' texts.

2.2.1. Osgood's 'Evaluative Assertion Analysis' (Osgood, 1959). Osgood's method of analysing the evaluative assertions in a text represents, in a sense, an attempt to incorporate grammar into a Content Analysis model. The procedure, which aims at assessing the attitude of senders to 'social objects' referred to in their messages, is outlined here in order to show that a method which treats each statement or proposition in a text as being of equal value, ignoring overall structure, is liable to produce inaccurate results, even when, to some extent, it takes syntax into account.

The method is divided into a number of stages, namely,

2.2.1.1. Categorization of Lexical Items in the Text: Items are divided into

/(a) Attitude

(a) Attitude Objects (AO's), which are items, normally Proper Nouns, referring to objects towards which people have different attitudes, eg. Russia, NATO, Bob Dylan, etc. The aim of the analysis is to measure the sender's attitude to the AO's mentioned in his text.

(b) Evaluative Common Meaning Items, which are words such as 'saint', 'sinner', 'delightful', 'ludicrous' etc., containing an inherent $\pm$ favourable feature, recognized by all speakers of the language.

(c) Non-Evaluative Common Meaning Items, such as 'bicycle', 'tree', 'purple' etc., which lack any inherent $\pm$ favourable feature, and are not used in the analysis.

2.2.1.2. Syntactic Normalization: Those sections in the text in which a particular AO is found related to an Evaluative Common Meaning item are extracted, and converted into a normalized structure of the form, 'AO + Connector (verb) + CM'. Thus the text structure, 'X's crusade against crime' will be normalized into, 'X crusaded against crime.'.

2.2.1.3. Connectors: The verbal connectors are classified as being either 'associative' or 'disassociative'. The former 'associate' Subject and Complement, whereas the latter 'disassociate' them. For example, 'love' is associative in the sentence, 'Saints love virtue', while 'despise' is disassociative in the sentence, 'Villains despise virtue'. Associative connectors are assigned a positive value, and disassociative connectors a negative value.

2.2.1.4. Assigning Numerical Values: Values on a 6-point scale are assigned to both CM's and to connectors. This is done intuitively, an

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item regarded as highly favourable, such as 'saint', 'delightful' etc. being rated as +3, a highly unfavourable item, such as 'villain' being rated as -3.

Connectors are rated in accordance with the degree to which they associate or disassociate Subject and Complement. Thus 'is' is highly associative, and is rated as +3, 'may be' as +1, 'may not be' as -1.

These values then replace the items in the analysis. For example, the assertion, 'X crusaded against crime' will become, 'X / -3 / -3 ' since the connector 'crusaded against' is highly disasociative, and the CM 'crime' is highly unfavourable.

2.2.1.5. Summing Numerical Values: For each assertion relating to a particular AO, the connector value is multiplied with the CM value. In the example above, the result would be +9 (-3 X -3). Then all the products are added, and the total is divided by the sum of all the connectors ignoring signs. The result will be to assign a total value between +3 and -3 to the AO. If the result is +3, then this is held to indicate that the sender approves highly of that particular AO. For example, from the text,

'John may be a trifle conservative but he's an excellent father.',

we can extract the two assertions, 'John may be a trifle conservative' and 'John is an excellent father'. These may yield the values,

John / +1 / -1 = -1
John / +3 / +3 = +9.

Adding the two products and dividing by the sum of the connector column gives a total of +2 ($\frac{8}{4}$). This will be taken to mean that the sender of this message approves of John rather highly.

/2.2.2. Criticisms.

2.2.2. Criticisms: Apart from the fairly obvious inadequacies of Osgood's semantic apparatus, the method is inherently impractical. Osgood admits that it requires one hour of coder time to analyse 133 words of material. In addition to this, however, it can be shown to produce counter-intuitive results when applied to some texts, because it does not take the overall structure of the text into account. For example, if we were to apply the method to the following, not impossible, text,

'John is idle, drinks too much, beats his wife occasionally, and has a tendency to chase women. Yet he's basically a good man.',

we would extract the assertions,

1. John is idle 2. John is a drunk 3. John is an occasional wife-beater 4. John is a womanizer 5. John is basically a good man.

The result of assigning values and computing the total would certainly be a minus number, since the negative value of the first four assertions would outweigh the positive value of the fifth. The conclusion that the author of the text disapproved of John would not square with our intuitive judgement that the author's attitude was one of reluctant approval with many qualifications. In fact, partly because of its position, the fifth assertion can be taken as outweighing the other four.

A. L. George makes precisely this point when he criticizes statistical analysis on the grounds that the analyst often assumes that 'each individual item ... is of equal significance for purposes of inference (George, 1959: 23). A similar point is made by Gopnik, who suggests that as far as the use of frequency counts for interpretative purposes is concerned, 'certain portions of the semantic framework of a text are more important than others in the determination of the semantic content' and concludes that frequencies

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of items at these points should be weighted (Gopnik, 1972: 107)

2.2.3. Conclusion: It seems obvious that while some form of sentence grammar is essential to the process of reading comprehension, it is not in itself enough, and needs to be supplemented by an interpretation of the overall structure of a text. Wardhaugh's remark cited earlier (2:1) can be extended to a claim that it is not possible to arrive at the meaning of a text by adding together the meanings of its component sentences like beads on a string.

2.3. Overall Textual Structure: A recognition that an awareness of the overall structure of a text is a vital component in comprehension is not, of course, a new one. Taxonomies of reading skills (eg. Davis, 1944) usually incorporate 'Recognition of Overall Text Structure' as an important, high level skill. Such taxonomies have come under attack from Bormuth and his associates, on the ground that test tasks related to such skills 'depend primarily upon the introspections of a test writer' (Bormuth, Carr, Manning and Pearson (1970: 351). However, there may be little wrong with such introspection, particularly if it results in an interpretation which agrees with other people's intuitions, and particularly if it can be formalized as an explicit analysis. Moreover, it is doubtful if a teacher, particularly one teaching older, more advanced students, will be able to confine himself to test-tasks of the comparatively simple syntactic and semantic types advocated by Bormuth.

Writing about the Content Analysis of propaganda messages, A. L. George says, 'The propaganda intention of an individual communication (and its effect as well) often depends not merely on the explicit

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content of the individual statements or propositions therein contained but also on the structural interrelationships of these statements within that communication' (George, 1959: 22). Recently there has been an increased interest among psycholinguists and others in such structural interrelationships. Bormuth and his fellow workers have used inter-sentence relationships such as Statement - Explanation, eg. 'Joe quit the team. He didn't get to play enough.' as a component in reading tests. Other writers go beyond this. Crothers, for example, states that the proper unit of discourse analysis is 'an overall knowledge structure, rather than a set of independent sentences' (Crothers, 1972: 247). Thomas maintains that 'the meaning of the paragraph does not derive simply from the linear sequence of sentences..... The paragraph gives meaning to the sentences whilst consisting of them' (Thomas, 1968: 1,4). Freedle and Carroll speculate that 'the structure of a discourse can be regarded as a ready-made plan to help the reader understand it, be persuaded by it, or be inspired by it' (Freedle and Carroll, 1972: 363), and suggest that psycholinguists turn their attention to the analysis of discourse development and understanding.

Some experimental work on the effect of the organization of a text on its readability has been done by Frase (1972). He tested the hypothesis that when texts followed 'structural direction', consecutive items would occur close together in the text, and thus be easier to remember. He compared two orderings of sentences, a 'good' order,

A's are B's. B's are C's

and a 'bad' order,

B's are C's. A's are B's.

/S's

S's recognition scores for both texts were the same, but S's who had read the good order text did better on inference questions, and tended in free recall tests to produce the correct structural sequence. Frase suggests that the good order taught something about the text structure which acted as a cue for generating appropriate combinations, and that further studies should investigate the effect of different types of relationship between sentences.

This is, in fact, what the present study sets out to do. Such an investigation requires, however, to be based on explicit analyses of the discourse structure of texts which must often be much more complex than the texts used by Frase. In consequence, the remainder of this chapter consists of a description and discussion of different forms of discourse analysis, and, where this has been done, of their application in either experimental or pedagogic situations. The particular analyses selected for discussion have been chosen because they all relate at some points to the analyses used in the present study.

2.4. Models of Discourse Analysis.

2.4.1. Labov and Waletzky's Analysis of Narrative Texts: Labov and Waletzky (1967) analysed a number of oral narrative texts collected in the field. They define a narrative text as one containing at least one pair of Narrative Clauses. These are independent syntactic structures referring to events in the order in which these events took place in time. The order of Narrative Clauses in a text cannot be altered without the interpretation of the sequence of events being altered too. Thus the following text,

/'I

'I crossed the street. I bought a newspaper.'

contains two Narrative Clauses, since a reversal of the sentence order has the effect of making the altered text refer to a different sequence of events. On the other hand, the sentence,

'John sang and danced'

does not contain two Narrative Clauses, since the order of conjuncts can be reversed without altering the meaning. Most subordinate clauses of time can be altered in position relative to the main clause without the meaning of the sentence being altered, and are thus not considered Narrative Clauses in this analysis.

2.4.1.1. Categorization of Clause Types: Narrative texts typically contain independent syntactic units which are not Narrative units according to the definition above. Labov and Waletzky categorize the different clause types according to the amount of freedom with which a clause can be moved in the text without the overall meaning being changed. This can be illustrated by one of their own examples:

x. and I crossed the street
y. and they was catchin' up to me
z. and I tripped, man.

In this text, Clauses x. and y. cannot be moved relative to each other without the interpretation of the sequence of events being altered. They are thus Narrative Clauses. If one assumes, however, that Clause y. refers to a process taking place all through the time referred to by the text, then Clause y can be moved, or 'displaced', to a position preceding Clause x, or following Clause z, without the meaning of the

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text being altered.

The amount of movement, or the 'Displacement Range' permitted to a clause is then used to distinguish three main types of clause, namely:

1. Narrative Clauses: these are fixed in relation to one another.

2. Free Clauses: these can be moved to any position in the text, though Labov and Waletzky point out (p. 24) that this will often involve changes of anaphoric reference. In the example above, Clause (y) is a Free Clause.

3. Restricted Clauses: these are less fixed than narrative clauses, and can be moved round one or more such clauses, but are not as unrestricted in Displacement Range as Free Clauses.

2.4.1.2. Primary Sequence: Labov and Waletzky then proceed to establish what they call the 'Primary Sequence', the basic form underlying all narrative texts. This basic form is arrived at through a number of operations, the main one being the shifting of each clause as close to the beginning of the text as possible without altering the semantic interpretation of temporal sequence. Thus all the Free Clauses are moved to the front, followed by the Restricted Clauses, and the Narrative Clauses come last. This has the effect of isolating the sequence of narrative clauses, and of making explicit the 'a and then b' relationship between them, which Labov and Waletzky consider the prime characteristic of narratives.

They consider this Primary Sequence as representing the basic

/underlying

underlying form of the narrative text, by implication the 'simplest' form. On analogy with sentence grammar, the primary sequence is the deep structure, while the linear form selected by the narrator forms the surface structure. This raises the problem of why the narrator often, indeed normally, selects a linear order that deviates considerably from the order of the Primary Sequence. Labov and Waletzky attempt to explain this deviation by an appeal to the functions of different sections of the narrative text.

2.4.1.3. Functional Sections: These sections, defined according to function in the Narrator/Audience situation, are given below in the order in which they generally occur in the text:

1. Orientation: This section orientates the hearer to person and/or place, time etc. It often consists of one or more Free Clauses. Labov and Waletzky point out that children often omit this section in their narratives.
2. Complication: This section contains the main body of narrative clauses.
3. Evaluation: This section, which either suspends or concludes the preceding one, serves to make the point of the narrative, to indicate to the listener the relative importance of the events described, and to indicate the point where the Complication has reached its maximum. The fact that the Evaluation section often consists of Free or Restricted Clauses has the effect of disturbing the straightforward narrative sequence. In fact, Labov and Waletzky consider

/that

that the presence of this section is the main factor causing narratives to diverge from the Primary Sequence.

4. Resolution: Defined as the part of the narrative that follows the Evaluation.

5. Coda: An optional section, which functions to bring the 'verbal perspective' back to the present, eg. 'And they lived happily ever after'.

2.4.1.4. Comments: The Labov/Waletzky analysis represents an interesting attempt to relate a formal analysis of a text to a functional one. That is, first the clauses in the text are analysed formally in relationship to each other, the criterion being the amount of 'displacement' permitted them. Then an underlying 'deep structure' is postulated. Finally a functional analysis is used to explain why narrative texts normally deviate from this underlying form.

2.4.1.5. Contacts with the Present Study: In Experiment 1 of this study (cf. Chpt. 4), texts organized according to a 1st Event-1st Mention principle were compared for readability with texts containing the same content but deviating from the 1st Event-first order. That is, texts of a general 'A and then B' type were compared to texts of a 'B after A' type. This obviously relates to the Labov/Waletzky study, since for them, the 'A and then B' relationship is the defining characteristic of narrative texts. Labov and Waletzky refer to 'the expectation that the events described (in a narrative) did, in fact, occur in the same order as they were told in' (p.30). In Experiment 1, it was hypothesized that such an expectation on the part of a reader would result in a text organized on such a basis being more readable.

/Both

Both Pre-Experimental Passages used in the experiment constituted 'Narrative Texts' in that both contained Narrative Clauses. In the analysis of the Pre-Experimental Passages, Labov and Waletzky's method of categorizing clauses into different types was used to distinguish those clauses which referred to sequential events from those that did not. One major deviation from Labov and Waletzky's procedure was that Subordinate Clauses of Time in the Pre-Experimental Passages which referred to events in the series were treated as Narrative Units. It proved possible to incorporate them in the analysis by first transforming them into independent sentences.

It did not prove necessary to make use of the functional analysis outlined above.

2.4.2. Gopnik's Analysis of Scientific Texts: Gopnik (1972) analysed a number of short scientific texts in order to establish 'a computable underlying form'. The texts were selected from research reports submitted by scientists wishing to give a presentation at a meeting of The Federation of American Societies for Experimental Biology, and were summaries about 250 words long. Gopnik proceeded in the following way:

2.4.2.1. Normalization: First she 'normalized' the texts. This involved two main procedures:

(a) The texts were 'decomposed', being rewritten as a series of simple sentences, with zeroed or pronominalized elements being restored. For example, the sentence, 'The children laughed and played.' would be decomposed to yield the two sentences, (i) The children laughed. and (ii) The children played.

/This

This process was applied both at intra-sentential level and at inter-sentence level. In the above sentence, for example, the zeroed elements can be restored on the basis of the sentence alone. However, it was frequently the case that in order to restore pronominalized or zeroed items, reference had to be made to textual structures outside the boundaries of a single sentence. For example, the demonstrative pronoun 'This' in 'This shows that ...' can only be restored if we know its referent, and this can only be found by referring to other parts of the text.

The decomposition process also made it necessary to distinguish, among other things, between different uses of the passive, and different uses of certain conjunctions, in particular 'and' and 'or'. For example, Gopnik found it necessary to distinguish between four different uses of 'and', namely,

(i) Normal 'and': N_1 'and' N_2 + V N_1 + V, N_2 + V.

(ii) Temporal 'and': N_1 + V_1 'and' V_2 N_1 + V_1 'and then' N_1 + V_2.

(iii) Compound Subject 'and': eg. 'Hens were fed (X 'and' Y).

(iv) 'And' from rearrangement: eg. 'X and Y are similar' 'X is similar to Y'.

The method of restoring zeroed elements by reference, when necessary, to other parts of the text, was applied not just to sentence constituents but also to larger structures. For example, from the sentence,

'Animals in Group A were heavier than animals in Group B.'

it is possible to 'restore', if necessary, the structures,

'Animals in Group A were measured by weighing.'

'Animals in Group B were measured by weighing.'

/'The

'The results were compared.' etc.

(b) The other main part in the normalization procedure consisted of replacing stylistically variable structures, in particular structures representing comparative constructions, with structures of a standardised type. For example, the sentence,

'The performance of the first group was significantly better than that of the second group.'

was replaced by the standard form,

Group 1 in respect of performance = X

Group 2 in respect of performance = Y

X - Y = significant difference.

Gopnik's reason for carrying out these normalization procedures is that they make the underlying pattern of relationships between the different parts of the text more explicit. She considers that the texts in their original form were produced from an underlying 'normal form' by 'paraphrastic permutations, substitutions and zeroing' (p. 16). Gopnik's 'normal form' is in some ways comparable to Labov and Waletzky's 'primary sequence' (cf. 2.4.1.2.), a major difference being that unlike Labov and Waletzky, she offers no explanation for the writer's deviation from the normal form apart from 'stylistic variation' (p. 47).

2.4.2.2. Categorization of Different Types of Text: Gopnik proceeds, after the texts have been normalized, to classify them into three major types, according to (a) the types of structures that occur in them, (b) the position in the text of particular structures, and (c) the non-occurrence in a text of certain structures. Usually she gives the

/structures

structures a semantic description as well, but these are intended to serve, at least initially, as 'mnemonic devices' (p. 103). The three main kinds of text (excluding sub-classes) are as follows:

1. Controlled Experiment. This, in normalized form, consists of
   (a) A sentence or sentences presenting the experimental situation, normally of the form, 'N_1 + BE + V en.'.
   (b) A normalized measurement and comparison structure.
   (c) A 'Container Sentence', usually of the form, 'This (data, etc.) + Container Verb (proves, etc.) + S.

2. Hypothesis Verification. This consists of
   (a) A hypothesis statement, normally of the form, 'N person reports (etc.) that N_1 causes (etc.) N_2.'
   (b) An Intention statement (optional), of the form 'This problem (etc.) + be + investigated (etc.) by N method.'
   (c) A Container Sentence.
   (d) A Comparative or Descriptive section.

   (Sections (c) and (d) above may be reversed in order of appearance).

3. Technique Descriptive Texts. These are normalized by the description of a sequence of events in chronological order, 'A and then B' etc.

Pure analysis apart, Gopnik sees the application of her work as being in the area of information storage and retrieval. She argues that her analysis can be used to produce a semantic framework, which provides a method of storing texts in a short but regularized form, and is

/superior

superior for this purpose to ad hoc methods such as selecting first and last sentences, etc.

2.4.2.3. Comments: The main interest of Gopnik's study would seem to lie more in her techniques of analysis and normalization of texts, than in her eventual 'findings'. It is hardly necessary to use an elaborate analytical apparatus to reveal that the report of a scientific experiment will contain an account of the initial situation, a description of what was done, and a conclusion giving the results. However, the technique of syntactic decomposition, with the subsequent exposure of different uses of the passive, and of certain common conjunctions, etc. would seem to have pedagogical applications in the fields of both writing and comprehension. So might the normalized outlines of various types of scientific text.

Of particular interest from the point of view of this study is Gopnik's suggestion that certain structures in a text play a greater role in the determination of the meaning of the text than do other structures, and that it is possible to locate these important parts by viewing the text as a sequence of sentences within the structure of a particular type of text.

2.4.2.4. Contacts with the Present Study: Gopnik's procedure of syntactic normalization, such as the breakdown of 'VP + 'and' + VP' into two units, with restoration of deleted NP's, etc., is similar to the procedure carried out in the analysis of the texts used in Experiments 1 and 2 (Chpts. 4 and 5). While the procedures were arrived at independently, (they are fairly obvious), Gopnik's term 'decomposition' has been borrowed and is used there.

/2.4.3.

2.4.3. Crothers' Analysis and Subsequent Experiment: Crothers' aim is 'to determine the interplay between linguistic structures in prose and structures in memory as inferred from data gathered in prose recall tasks' (Crothers, 1972: 247-8). The linguistic structures he has in mind are extra-sentence relationships, holding between either sentences or larger units of a text. Basically, then, he is interested in determining whether a particular form of textual organization can be shown to affect subjects' memory of a text.

His method is to produce two parallel texts, sharing the same semantic content, and differing in surface detail, mainly linear organization. A single analysis of semantic structure is produced for both texts, this analysis being considered to represent the semantic content of both versions. The actual texts he considers to derive from this underlying level by processes of transformations, pronominalization, use of synonyms, etc. This view of the relationship between the actual text and the underlying level, is, of course, very similar to that taken by Gopnik (cf. 2.4.2.1.). Next, experimental subjects having read one or other version, and attempted a free recall task, Crothers compared the incidence of successful recall of items, both between the two versions, and between different parts of the same text.

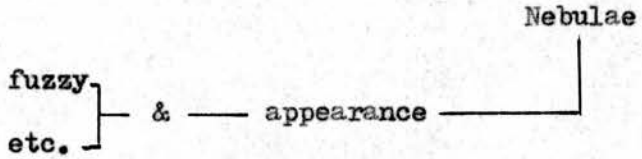
2.4.3.1. Analysis of Semantic Relationships: Crothers sees the underlying structure of a text as consisting of a set of semantic hierarchies, made up of propositions arranged in such a way that each subordinate proposition logically implies the proposition immediately superordinate to it. The propositions can appear explicitly in the text, or be implicit. For example, the two propositions explicit in Crothers'

/'Nebulae'

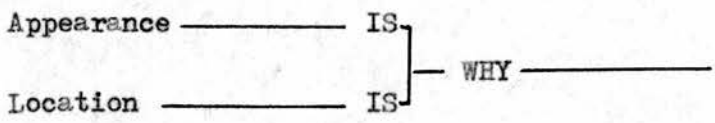
'Nebulae' text,

1. One kind of nebulae is outside our galaxy.
2. One kind of nebulae is inside our galaxy .

are considered to be subordinate to the implicit proposition, 'Nebulae have location'. Similarly, the proposition, 'Nebulae look fuzzy' is subordinate to the implied proposition, 'Nebulae have appearance', as are any other propositions in the text that relate to the appearance of nebulae. The semantic hierarchies are then mapped as in the following diagram:



The logical connectives 'AND' and 'OR' are used to indicate conjunctive and disjunctive relationships between propositions, and between sub-trees. In addition, the connective 'Because', rather confusingly symbolized in the mapping as 'WHY', is used to indicate that one sub-tree is related to another by a Cause/Effect, or Premise/ Conclusion relationship. Thus the mapping,



denotes that the Appearance of Nebulae is a result of their Location.

2.4.3.2. Experimental Texts: The two experimental texts differed from each other mainly in respect of the linear order of statements. While the organization of Version 'A' could be outlined as,

2 kinds of nebulae - 1st kind, outside: Appearance, Composition, etc.
2nd kind, inside: Appearance, Composition, etc.,

the 'B' text followed the order,

/2 kinds

2 kinds of nebulae 1st outside, 2nd inside.

1st, Appearance; 2nd, Appearance.

1st, Composition; 2nd, Composition, etc.

The length of the two versions, number of sentences, and relative frequency of occurrence of items, were all held more or less constant.

2.4.3.3. Crothers' Experiment: Basically, this consisted of having 9 college students read Version 'A' and 9 reading Version 'B'. Both groups then attempted a free recall task. Scoring was carried out by reference to the analysis of the underlying structure, each individual item in the analysis being scored on the basis of number of successful recalls.

It is unfortunate that the numbers Crothers used were so low. In fact, due to certain permutations in the basic experiment, the numbers in one group sometimes dropped to as low as 3, which is a hopelessly small number.

Results: Mean recall scores for texts 'A' and 'B' did not differ significantly. It thus appears that sentence ordering had no effect on recall. Crothers points out that both forms of ordering used were quite acceptable.

The other possible comparison was between recall of different parts of the underlying structure. Crothers had two hypotheses about this. The first was that superordinates would be recalled more frequently than subordinates. The second was that 'primary' sub-trees , ie. those connected by 'WHY' on the right-hand side of the mapping, would be recalled more frequently than 'secondary' sub-trees, ie. those not dominated in the mapping by a superordinate 'WHY'. Neither hypothesis

/was

was confirmed.

Crothers considers that the results can be partly explained by an appeal to frequency of occurrence. There was a high correlation between the frequency of mention of sub-topics, and their recall. Frequency, Crothers suggests, serves to guide comprehension by foregrounding and giving emphasis.

As another possibility, Crothers suggests that what was foregrounded in the texts was a classification of nebulae, and hypothesizes that the best remembered predicates will be the ones that are transformed, in the superficial structure, into modifiers of Nebulae, eg.,

Nebulae are galaxies galaxy Nebulae + VP.

2.4.3.4. Comments: It is not clear how these suggestions could be tested without a radical revision of the analysis, which would have to take surface features of texts, such as foregrounding, relative position of propositions in the text, etc., much more into account than the present analysis of 'semantic content' does.

It is one of the most unsatisfactory features of Crothers' analysis that a Causal relationship between two units is held to be superordinate to both the units. That is, given a sentence like, 'John stopped because the lights were red', the analysis will show that the Causal relationship between John's action and a particular state of affairs is superordinate to both action and state. This seems unlikely since, in a particular context, the 'main point' being communicated may well be the fact that 'John stopped'. The additional explanation may well be brought in, as Dakin says, to anticipate or answer the hearer's question 'Why?' (Dakin,

/1970).

1970).

In fact, the most superordinate nodes in Crothers' mapping are those showing Causal relationships between sub-trees, and Crothers suggests that a summary of the text could be produced by 'pruning off' all but these nodes. This, however, results in a very unsatisfactory summary.

For example, both of Crothers' experimental texts begin with a Definition and Classification of Nebulae. But since this sub-tree is not connected by 'WHY' relationships to any other sub-tree, then it is relegated to being a minor sub-tree in the hierarchy, and is not included in the summary, which thus informs us that the Appearance of Nebulae is a result of their Location, but fails to tell us what Nebulae are.

It is not surprising that the recall scores of the experiment showed that 'because' relationships were often reduced to 'and' and that sub-trees tended to be recalled independently. Crothers is to some extent aware of this apparent weakness in the analysis, as can be seen from his statement that 'the assumption ... that the gist is defined graphically as the more superordinate nodes ... need not be correct (p.247).

2.4.3.5. Contacts with the Present Study: Of the studies described in this section, Crothers' approach is closest in outline to the present study. The method of preparing two versions of a text, containing the same content but differing in surface organization, etc., is common to Crothers' study and to Experiments 1, 2 and 4 of the present study (Chpts. 4, 5 & 8). In both cases, Free Recall was used as a test-task, in experiments designed to test the comparative readability of the two versions.

There are even some resemblances in the details of results. Crothers

/found

found that 'Because' relationships tended to be replaced by 'And', and also that units linked by 'Because' were often recalled independently. Both these results were also found in Experiment 4 of this study (cf. Chpt. 8).

2.4.4. Thomas's Flow-Diagrams (Thomas, 1968) and Thomas & Augstein's Reading Experiments (Thomas & Augstein, 1972): The two papers mentioned above form part of a group of material prepared at Brunel for the purpose of instruction in advanced reading. In the account given here, the following undated papers are also referred to:

Draft Material Prepared for the Open University.

Theme 1: Roles, Attitudes and Purposes in Reading.

Theme 2: Researching One's Own Reading as a Skill.

Theme 3: The Criteria and Measurement of Reading Outcomes.

Theme 4: The Teaching of Higher Order Reading Skills.

The material includes a hierarchical classification of knowledge based on Bloom's 'The Taxonomy of Educational Objectives' (Bloom, 1956), a similarly hierarchical classification of reading-to-learn tasks (Theme 1), the use of a Reading Recorder to provide students with feedback on their reading behaviour (Theme 2, Section 2), and a programmed series of training modules (Theme 4, Appendix A). Only some of this material will be touched on here.

2.4.4.1. Thomas's Flow-Diagram Technique: The analysis of a text is performed in the following stages:

1. The analyst first decides on the relationships holding between the units forming the text. The units vary according to the level at which

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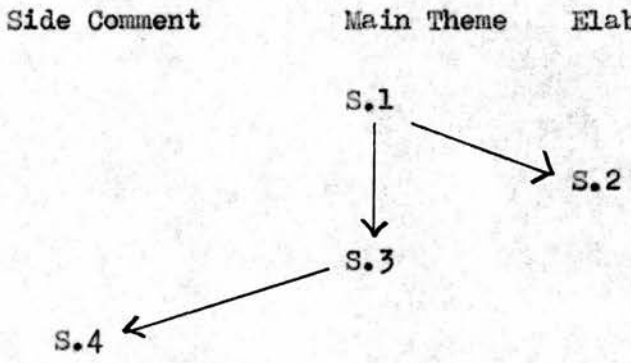
the analysis is being done: at paragraph level, the units are generally sentences. At whole text level, they are likely to be paragraphs.

2. The relationships are assigned to different categories. The ones mentioned by Thomas are Main Theme, Illustration, Elaboration, Link and Qualifier.

3. These relationships are mapped as a flow diagram, the vertical plane being used to indicate linear ordering of the text, and the horizontal plane to indicate the different categories; eg.



4. Once this mapping has been completed, it can be compared with other mappings of the text done by different analysts, so as to arrive at a 'shared subjective meaning'. This is then used for preparing material and for instructional purposes.

2.4.4.2. Reading Experiment: Thomas and Augstein used a rather different form of analysis in the second reading experiment they carried out (Thomas and Augstein, 1972). Here subjects were given the task of writing a summary. This involved them in distinguishing between generalisations and specifics in a text. With this in mind, the text was first analysed into 'units of knowledge' and these units classified, according to Bloom's Taxonomy, into Generalizations, Ways and Handling Specifics, and Specifics. This analysis, carried out by experts in the

/content

content area, was then mapped as a flow diagram, which could then be used for instructional purposes, and for scoring subjects' summaries.

In the experiment, 25 subjects were divided into two groups. The control group had three sessions of reading the text, using the reading recorder, with no instructions. The experimental group had two reading sessions, and two training sessions in which the structure of the text, their own reading pattern, and the relationship between the two were explained. Both groups wrote summaries. The performance of the experimental group improved significantly in the course of the experiment, whereas while the control group's performance improved, the improvement did not reach significance level. Thomas and Augstein conclude that 'training appeared to influence task definition, with the result that operational plans were more aligned with performance' (p.44).

2.4.4.3. Comments: Thomas and Augstein's use of the concept of 'shared subjective meaning' is of particular interest. That a reader's interpretation of a text, and of the structure of a text, will depend not only on who he is but also on his purpose in reading it has probably not been sufficiently recognized in accounts of comprehension. Since different readers are likely to extract different kinds of information from a text at different times, it would seem advisable to arrive at a concensus as to the 'meaning structure' before experimental or pedagogic work began.

The use of flow diagrams is likely to make it easier to arrive at such a concensus. Crothers argues that mapping the structure of a text in the form of a graph represents 'one's ability to outline a passage more or less in accord with someone else's outlines' (Crothers, 1972: 277).

/Thomas's

Thomas's flow diagrams seem better fitted for this than Crothers' mapping in that they are far less complicated. Because of this, they are also better fitted for instructional purposes.

The categories of inter-unit relationships mentioned by Thomas are quite traditional, and as such, probably useful for pedagogical purposes. They suffer, however, from a lack of formal definition. The distinction between Illustration and Elaboration, for example, is not clear.

The use of Bloom's Taxonomy to categorize 'knowledge units' for the summary-writing experiment has the advantage that, inside a given content area, it would seem to be fairly easy for experts to decide on what constitute generalizations and what specifics. It has the disadvantage, however, that it appeals to an extra-textual taxonomy which may not be relevant to the structure of a particular text.

2.4.4.4. Contacts with the Present Study: The informal categories of inter-unit relationships proposed by Thomas share some similarities with the categories used in Experiments 3 and 4 of this study. More generally, the view held by Thomas and Augstein that recognition of the structure of a text, in terms of the relationships between different units, is a feature of higher-level comprehension has influenced the view here that surface organization of texts, by making such relationships either clearer or more obscure is a factor in the readability of a text.

2.4.5. Work Done at Hatfield Polytechnic: At Hatfield Polytechnic, E. Winter and his associates have investigated problems of communication affecting students of the Polytechnic in such activities as writing technical reports, and have suggested methods of helping the students

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overcome these problems. The main aim of the Hatfield workers is thus, as in the case of Thomas and Augstein, a pedagogical one, one major difference being that at Hatfield the primary emphasis has been placed on writing rather than reading. Since to some extent the problems involved in reading and writing can be viewed as mirror-images of each other, and the Hatfield work has a lot in common with the other studies mentioned in this chapter, a brief account is given below.

The following papers are referred to:

(a) 'Progress report of work done at the Hatfield Polytechnic on the practical aspects of research in English Language' (Hoey, 1971).

(b) 'Models of Coherence in Textual Analysis: one antidote to Examination Confusion' (Winter, undated).

(c) An untitled and undated report by Dea and Winter on the Hatfield work.

After examining students' written work, the Hatfield researchers concluded that 'grammar and punctuation were not the only problems, and perhaps not even the main ones. Equally important appeared to be those of selection of information and the organization of that material once selected.' (Hoey, 1971, p. 7). In order to demonstrate this, they gave students two tests. In the first, individual sentences were 'jumbled' and had to be reordered. In the second test, the order of sentences in a text were jumbled, and the students had to re-assemble the whole text. The second type of test proved harder to complete than the first. Hoey concludes that the tests revealed 'weaknesses in selecting correct information and in organizing it according to logical principles in a

/readily

readily understandable order' and that students showed 'weaknesses in the use of the paragraph as sense unit' (Hoey, 1971: 8).

A specific weakness revealed by examination of students' normal written work was in the area of 'Semantic Clause Relations', 'where a clause relation is roughly how we understand one clause (or sentence) as interpreted in the light of another' (Dea and Winter, p. 2). In order to remedy this, a course of training was devised, based on Winter's analysis of Clause Relations.

2.4.5.1. The Analysis: Winter's clause relationships are of two major kinds, which he calls 'Matching' and 'Logical sequence' (Winter, p. 2). Matching relationships can be illustrated by Winter's example,

> 'Religious man was born to be saved: psychological man is born to be pleased.'

Here 'religious' and 'saved' in the first clause are balanced against 'psychological' and 'pleased' in the second clause. The matching in this case is of the contrastive type. As sub-types of matching, Winter cites,

> General/Particular, Hypothetical/Real, Denial/Correction (p. 3).

The Logical Sequence type, which, according to Winter, 'involves a fundamental notion of constant change in time/space' (p. 2) includes relationships such as 'S_1 so S_2'. Winter gives particular prominence to the sub-type 'Denial/Correction', eg.'X is not a wicked man. He gives freely to charity'.

These relations are binary, although each member of a pair may be made up of more than one clause of sentence (Dea and Winter, p.2).

Winter points out that Prediction plays an important role as far as

/these

these relationships are concerned (pp. 2-3). Prediction is in terms of strong probability, not inevitability, and what is predicted is a particular type of relationship, not the actual content of that relationship. 'Anticipation' is also likely to occur, when the clause relationship is made explicit in advance by a connecting 'lexical' item.

2.4.5.2. 'Functional Analysis': In addition to the analysis of inter-clause relations, the Hatfield workers also made use in their remedial course of a rough description of the likely components of a technical report. Hoey argues that 'all serious communication attempts to give the reader or listener the information that it is thought he wants or ought to want' (Hoey, 1971: 9). The information the reader of a technical report is likely to want can be roughly classified as

1. The Situation
2. The Problem
3. What was suggested, or tried out, as the solution (p. 10).

This outline is very similar to the outlines of scientific texts arrived at after analysis by Gopnik (cf. 2.4.2.2.). And Hoey's comment that 'examination of students' work indicates that they are inclined to ignore the Situation part' (p. 10) recalls the comment by Labov and Waletzky, that children often leave out of narratives the 'orientation' section, which, of course, performs the same general function as Hoey's 'Situation' (Labov and Waletzky, 1968).

2.4.5.3. The Hatfield Remedial Course: Chemistry students at the Polytechnic attended a weekly course during which they were encouraged to discuss and emend the organization of texts in terms of the analysis

/just

just described. After two terms, they were tested for their ability to reorder a jumbled text, and the results were compared with their pre-course test performance. Performance had improved in all but one case. Hoey does not say whether the results were statistically significant, and admits that the number of subjects was small (10 completed the course). (Hoey, 1971: 13).

2.4.5.4. Comments: While similar to the work done at Brunel, the Hatfield work is not as broadly based as that of Thomas and Augstein, and lacks the framework of definitions of learning tasks used by them. However, it represents an interesting pedagogical application of an analysis of rhetorical inter-clause/sentence analysis, together with a functional description of components of texts, in the general framework of a communication situation.

2.4.5.5. Contacts with the Present Study: The principle connection is between Winter's 'Semantic Clause Relations' and the Inter-Sentence relations employed in Experiments 3 and 4 (cf. Chpt. 6). The connection is particularly close between the latter and Winter's second main category, 'Logical Sequence Relations', though the matching sub-type of Generalization/Particular or Exemplification corresponds to the Assertion/Exemplification relationship used in this study. The two different analyses have been arrived at independently, but show quite close ressemblances. On the whole, Winter's analysis seems capable of being applied to a wider range of material.

Winter's view of the role of Prediction, involving the prediction of a relationship, is similar to the view taken in Experiment 3 that, given a sentence such as,

'The woodpecker is an unusual bird'

/the

the reader will be able to predict the sort of utterance which is likely to follow, and hence will either read faster, or recall better (cf. Chpt. 7).

More generally, the view taken by the Hatfield researchers that better communication will result when readers' expectations of relationships are satisfied, is similar to the view taken here, particularly in Experiments 3 and 4, in the context of the readability of a text.

2.4.6. Common Elements in the Studies: Apart from a shared belief in the importance of overall structure of texts, the five studies described above have a number of features in common. Some of these similarities have been pointed out in the course of describing the studies. What follows is a summary of the main points shared by two or more analyses.

2.4.6.1. Underlying Structure: Labov and Waletzky, Gopnik and Crothers refer explicitly to an underlying structure distinct from the surface structure of the text. Labov and Waletzky call it the 'Primary Sequence', Gopnik the 'normalized structure', and Crothers calls it the 'underlying level'. Thomas, by remarking that 'meaning is only poorly represented by a linear sequence of words', and that the meaning of the text can be better displayed by the representation of a flow diagram, (Thomas, 1968:4) appears to imply that this representation underlies the surface, 'linear' text. Labov and Waletzky compare the relationship between the Primary Sequence and the surface text with deep and surface levels of sentences, but this is apparently only intended as an analogy. Gopnik and Crothers appear to regard the underlying structure as an actual stage in the production of the surface text, which is produced from it by a process of grammatical transformations, substitution of synonyms, etc.

/2.4.6.2.

2.4.6.2. Inter-Unit Relationships: Labov and Waletzky, Thomas, Crothers, and Winter et al regard the internal structure of a text as being built up of various kinds of relationship holding between different units of the text. These units are variously defined as (a) clauses (Labov and Waletzky); (b) sentence constituents, sentences and paragraphs (Thomas);(c) propositions (Crothers); (d) clauses and sentences (Winter).

Gopnik refers to 'inter-sentence dependencies' (p. 19), but in the majority of cases, the structures she analyses relate, not to each other, but to an overall textual framework. For example, her 'Container Sentences' are defined, not in relation to other structures of the text, but in part by their syntactic/semantic properties, in part by the function they perform in presenting the conclusion of the experiment. In her analysis of 'Technique/Descriptive' texts, she does deal with inter-sentence relationships of the 'A and then B' type, but her technique of handling these, by assigning to each fixed times, and then comparing these times, results to some extent in the neutralization of the relationship between the sentences as they stand in the text.

2.4.6.3. Hierarchical Structure: Thomas and Crothers both propose a hierarchical structuring of texts. In Thomas's case, this holds mainly between smaller units of the text, sentences etc. and larger units, paragraphs etc. In Crothers' case, the hierarchical relationship holds between propositions and the superordinate propositions they logically imply.

2.4.6.4. Functional Descriptions: Labov and Waletzky, Gopnik, and Winter et al present a functional analysis of texts. In Gopnik's case, this is presented as being secondary to a syntactic description. That

/is

is, a 'Container Sentence', for example, is first analysed in terms of being made up of,

$$\text{'NP} + \text{V}_{\text{container}} + \text{that} + \text{S'}$$

and is then given a functional description such as 'presents the conclusion of the experiment'. In the case of Labov and Waletzky, the functional analysis is brought in to explain the discrepancy between the 'Primary Sequence' and the 'normal order'. While there is some correlation between form and function, the 'Orientation' section often includes or consists of 'Free Clauses' etc., there is no one-to-one relationship. The functional description used at Hatfield appears to be employed as an additional tool to Winter's Semantic Clause Relationships, and no attempt is made to relate the two.

There are some close resemblances between the three descriptions mentioned above. Labov and Waletzky's 'Orientation' section, Hatfield's 'Situation' section, and the opening structure in Gopnik's 'Controlled Experiment' and 'Hypothesis Verification' types, all correspond quite closely. All three descriptions refer to the possibility of a text lacking an essential functional section, and hence being deviant. Labov and Waletzky, and the Hatfield workers see this in the framework of a social, communications setting. If the Listener/Reader is deprived of the Orientation-Situation section, he will lack some necessary information for understanding the whole message. If a narrative text lacks an Evaluation section, the listener will not understand the 'point' of a narrative. Gopnik appears to see the problem in terms of the analyst attempting to reconstruct 'zeroed' elements. If a text contains a Measurement Statement but no corresponding Comparative structure, then

/the

the necessary Comparative structure cannot be reconstructed (Gopnik, p. 71). But the difference between the two approaches is one of emphasis only.

2.4.6.5. Frequency Counts: Gopnik and Crothers carry out frequency counts of items in the texts analysed. In Gopnik's case, this counting is peripheral to the main analysis, and the results are given in an appendix (pp. 133-4). In Crothers' case, the relative frequency of occurrence of items was taken into account in the preparation of the experimental texts (cf. 2.4.3.2.).

CHAPTER 3

COMMON FEATURES IN THE EXPERIMENTS

The experiments which are described in the following chapters have a lot in common as far as method and general procedure are concerned. In order to avoid repetition, this common material will be discussed here in a general manner. When experimental procedure deviated from that described here, the deviation will be pointed out. Otherwise it can be assumed that, in each of the experiments, the method used was as described in this account.

3.1. Texts: The basic experimental approach was to test the comparative readability of pairs of texts, which as far as possible differed from each other only in respect of a previously defined experimental variable. Since the chances of finding such a pair of texts already in existence are small, it was necessary to construct them. Generally, the procedure used was to select an already existing text, modify it, and use it as a basis for the construction of a pair of experimental texts. Already existing texts were preferred since it was thought that texts specially written for experimental purposes might be in some ways 'artificial'. However, in Experiment 3 (cf. Chapter 7) some texts were in fact specially written for the experiment. The stages of text construction are set out below:

3.1.1. Primary Passages: This term refers to already existing material which served as a basis for the experimental texts. Such passages were chosen primarily because their content was suitable for a particular

/experiment

experiment. For example, in Experiment 1, which was concerned with the ordering in a text of descriptions of events occurring sequentially in time, the Primary Passages had to contain descriptions of such events. They also had to be of a suitable level of difficulty for the subjects - usually 3rd year pupils in secondary schools. Moreover, the Primary Passages had to be either factual, or expository, the sort of factual material that students might be expected to read and study. In the main, the passages were taken from books on non-technical science subjects designed for laymen, or from newspaper articles. There is, of course, no particular reason why a Primary Passage must be taken from already existing material, and in one or two cases in Experiment 3, the experimental texts were specially written for the occasion.

3.1.2. Pre-Experimental Passages: This refers to texts produced from the Primary Passages as a result of any alteration not related to the experimental variable. Primary Passages often had to be abridged, or simplified. Paragraph divisions had to be eliminated. Often an initial sentence had to be supplied to act as introduction to a text which had been taken out of its context. The usual length of a Pre-Experimental Passage was between 120 and 180 words, that is, the length of a fairly long paragraph in a text-book.

3.1.3. Experimental Texts: These were derived from the Pre-Experimental Passage, and differed from each other according to the experimental variable. Sometimes the Pre-Experimental Text was such that it could serve without alteration as one of the Experimental Texts, on other occasions both Experimental Texts differed from the Pre-Experimental Text as well as from each other. Suppose, for example, that the experimental variable consisted of the presence or absence in a text of overt

/markers

markers of certain inter-sentential relationships - 'because of this', 'for example', 'admittedly' etc. - as was the case in Experiment 4. A Pre-Experimental Passage might contain one such marker, along with three instances of implicit relationships. In order to produce one Experimental Passage, this one marker would be deleted, resulting in a text in which all four inter-sentential relationships were implicit. To produce the other Experimental Passage, all four of these relationships would be made overt, by adding three markers to the Pre-Experimental Passage.

The two Experimental Passages forming a pair (referred to as Passage 'A' and Passage 'B') were controlled for number of words contained in each, and usually for number of sentences. On most occasions the Fog Readability Index of each was either the same or very nearly so.

Two such pairs of Experimental Passages were used in any one experimental session. This was the maximum number which could be done in a normal school period (30 to 45 minutes). Thus, for example, in one session of Experiment 4, there were two 'marked' texts, 1A and 2A, and two 'unmarked' texts, 1B and 2B.

3.2. Subjects: The subjects were drawn from the pupils of five Scottish Secondary schools. Of these, Craigmount, Portobello, Forrester and St. Augustine's are large comprehensive schools in Edinburgh. The fifth, Inverness Royal Academy, is a medium sized school, recently made comprehensive, in Inverness. Almost invariably, subjects came from third year 'O' group classes, that is, from those classes which were expected to sit 'O' level examinations in the following year. The one exception to this was in Experiment 4, when a 4th year class took part. The classes

/were

were mixed, pupils being between 14 and 16 years old. All the classes were streamed, usually on the basis of performance either in Mathematics or in Languages. In those classes that had been streamed on the basis of language marks, girls tended to predominate. In classes streamed for mathematics, the distribution of the sexes was more even.

3.3. Measures of Readability: It was necessary to decide on the criteria by which it can be said that one version of a study text is more readable than another. One obvious criterion is speed; one version of a text is more readable than another if it can be read more quickly. Another criterion is comprehensibility; a version of a text is more readable if the contents can be understood more easily inside a stated time.

What exactly is involved in comprehension and its measurement is, of course, a very difficult problem (cf. Carroll, 1972). Here the view adopted is that of Scriven (1972: 38), namely that 'you should not ask whether a person comprehends, but what a person must do to demonstrate comprehension'. In order to demonstrate comprehension of a study text, one of the things that the student must do is to recall the contents. Verbatim recall is seldom asked for, but his recall of the contents of the text must be accurate: inaccurate recall of information may sometimes be more of a handicap than no recall at all. In consequence, it was decided to test readability in terms of speed of reading, and recall of contents.

3.3.1. Intrusive Word Test: This was intended as a combined test of speed and comprehension. A more normal test of a subject's speed in reading a text is to note the time he begins reading and the time he

/finishes

finishes, subtract the first from the second, and then express the figure in terms of words per minute. Such tests are usually accompanied, as in Fry (1963) by comprehension questions, to be answered from memory. There are certain disadvantages in such a method. Firstly it results in two scores, one for speed, the other for comprehension, and these scores are not discrete, since speed alone will normally be considered useless if comprehension score is very low. Secondly, the method results in subjects being required to read and understand material outside the actual reading text, that is, the questions, and a low comprehension score may be due to failure to understand the questions rather than poor comprehension of the reading text. This factor is particularly important when one is testing, not subjects' general reading speed, but the readability of a particular text. Thirdly, it is difficult, in the case of texts of the length used in these experiments (140-180 words) to compose a large enough number of reasonable questions to ensure a spread of scores.

The Intrusive Word Test consisted of having subjects read a text into which a number of words not belonging to the text had been inserted and asking subjects to locate these intrusive words and underline them. Then subjects' 'speed of comprehension' was measured by the number of intrusive words they had located in a given time. The method has the advantages of resulting in a single measure of subjects' performance, of requiring students to read only the reading text being tested, and of providing a wide range of possible scores (this depends on the number of words inserted). Just what sort of 'comprehension' the method measures is difficult to say, but will be discussed below.

3.3.1.1. Test Construction: First a sequence of words from a text

/unconnected

unconnected to the Experimental Passages was selected. The words in this sequence were to act as the 'intrusive' words. This was done to prevent the experimenter from subconsciously imposing a pattern on the words to be intruded. Next, the order of words in the sequence was reversed. This was done to avoid the possibility of subjects' being distracted by noticing that the Intrusive Words, when strung together, 'made sense'. Then the Intrusive Words were inserted, one by one, into both members of a pair of Experimental Passages, at intervals determined by a random number sequence, chosen from the list of permutations of either 9 or of 16 given in Cox (Cox, 1958: pp. 295-297). The selection of a random permutation of 9 resulted, of course, in more intrusive words than did that of a permutation of 16.

An example should make the procedure clear. Suppose the following text is a member of a pair of Experimental Passages:

> 'Unless there is a big shift in voting intentions during the last few days of the campaign, the race on election night is going to be about whether or not Labour gets an overall majority.'

and that the word sequence chosen for insertion is,

Dishes from other countries include recipes for children to follow.

Then this sequence will first be reversed, yielding,

follow to children for recipes include countries other from dishes.

A permutation of 9, (Cox, perm. 111) has been selected. This begins,

5, 4, 9, 7, 1, 6, 8, 3, 2 .....

Then the sequence of intrusive words is inserted in the Experimental

/Passage

Passage, in accordance with this permutation. This will give the following Intrusive Word Test:

> 'Unless there is a big follow shift in voting intentions to during the last few days of the campaign, the children race on election night is going to for be recipes about whether or not Labour gets includes an overall majority.'

The same sequence of words would also be inserted in the other member of the pair of Experimental Passages. Then if subjects reading one member of the pair underlined correctly a significantly larger number of intrusive words than did subjects reading the other member of the pair, then the first member was judged to be easier to read/comprehend than the other.

The following points should be noted:

1. If any intrusive word, when inserted at the point determined by the number sequence, was judged to make sense in that context, that is, if there was a high probability of it being interpreted as belonging to the original text, then it was discarded, and replaced with the next word of the intrusive sequence. For example, in the text above, if the word to be inserted after 'Unless there is a big ...' had been 'popular', then this word would have been discarded. A slightly different situation would have arisen if, in the same context, the word to be inserted had been 'swing'. In such a case, the subject would have a choice of deleting either the intrusive word or the original word from the text, namely 'shift'. Here again the intrusive word was discarded. If, as happened occasionally, such a situation escaped the tester's notice, then on

/marking

marking, either choice was accepted.

2. Subjects who struck out words belonging to the original text were not penalized unless the number of original words struck out exceeded four to a line. In the event, this virtually never occurred. No marks, of course, were scored by underlining words of the original text, except in the case mentioned above, in section 1.

3.3.1.2. Discussion of the Intrusive Word Test: The test is comparatively easy to construct, and very easy to mark. It is also objective. The following criticisms might be made against it.

(i) It might seem to assume that readers proceed in a linear progression from top to bottom of the page, moving from left to right. There is evidence cited by Kolers (Kolers, 1968: p. 14) that some readers do not operate in this way. While such an assumption may have been made initially in the selection of the test, it does not seem to invalidate the use of the test. This is because subjects were scored, not according to the point they were judged to have reached in the text, but according to the total number of words they had correctly underlined. Thus there is nothing to stop subjects from beginning at the top left of the text, proceeding from there straight to the end, and then back to the middle.

(ii) It might be argued that very efficient readers ignore the intrusive words, in the same way as they have been shown to overlook misprints, etc. However, subjects were explicitly instructed in the task they had to do. Moreover, informal tests with two very fast readers showed that they performed the task as efficiently as slower readers and much more quickly.

(iii) The test can, with justification, I think, be criticized as testing

/syntax

syntax and semantics, inside sentence boundaries, but of being incapable of testing comprehension of wider stretches of text. This is the same criticism as has been levelled against the Cloze Technique, discussed below. The Intrusive Word Test cannot, as might be thought, be completed by the subject's behaving like some sort of finite state grammar. For instance, in our original example, the subject faced with the sequence,

Unless there is a big shift in voting intentions to during ....

cannot at this stage decide whether 'to' or 'during' is intrusive, though it seems fair to assume that one of them is. He must read on for several words before making the decision. Sometimes it is necessary to read a whole sentence before the decision can be made. It is true, however, that in virtually all cases, it is unnecessary to go beyond the sentence to detect the intrusive word. Thus this test is probably not, on the whole, sensitive to subjects' comprehension of discourse.

In fact, while the Intrusive Word Test was used in all the following experiment, it proved sensitive to differences between texts only on one occasion, namely Experiment 1. The effort, however, was possibly not as wasted as might at first seem. If we assume that the Intrusive Word Test is a valid indicator of sentence difficulty, then in those cases where it detected no difference between two texts, while another test, such as Recall, did detect a difference, we might argue that the two texts were equivalent at sentence level, but not at some higher level of organization. This is precisely what most of the experiments set out to do. The Intrusive Word Test then can be viewed as a control over sentence difficulty, rather than a test.

3.3.2. Cloze Procedure: The other test of Speed/Comprehension was the well-known Cloze Test, which was used in Experiment 1 (Sub-Test 2) as an alternative to the Intrusive Word Test, and as a substitute for the Intrusive Word Test in the first re-run of Experiment 3.

Schlesinger has argued that Cloze is unsuitable as a test when one is testing the comparative readability of two parallel texts (Schlesinger, 1968: 154-5). He argues that if one uses the standard form, and deletes every 5th word, then one is likely to delete different words in the two texts. If, on the other hand, one deletes the same words from each text, then the deletions will occur at different intervals. In each case, one will introduce an uncontrolled variable into the experiment. In Experiment 1, both forms of Cloze were used, but the results were quite inconclusive. In Experiment 3 (1st re-run), the standard form of Cloze was used, that is, every 5th word was deleted from each text. In the later case, the Cloze Test detected a difference between two texts where the Intrusive Word Test had previously found no difference. It may be, then, that Cloze is more sensitive.

Some writers have suggested that Cloze scores can be obtained by the subject's referring only to the immediate context, that is, that Cloze, like the Intrusive Word Test as argued above, is 'sentence bound' (George, cited in Osgood, 1964: 85; Carroll, 1972: 18). However, S. Ramanauskas has produced evidence that Cloze is sensitive to segments longer than a sentence (Ramanauskas, 1972). Ramanauskas jumbled the sentences of texts, applied Cloze to jumbled and normal versions, then tested to see whether there was any difference in readability. Subjects reading the normal versions scored significantly higher than those

/reading

reading the jumbled versions.

Cloze Procedure is in some ways analogous to the Intrusive Word Test. In Cloze, subjects restore a mutilated text by supplying words, in the Intrusive Word Test, they restore the text by deleting words. The Intrusive Word Test can be done more quickly than Cloze, since subjects do not have to write anything. However, if one accepts Ramanauskas' findings, Cloze is sensitive beyond the sentence boundaries, whereas I am inclined to think that the Intrusive Word Test is not.

3.3.3. Recall Tests: The second test task normally used in the experiments was normally one of free recall. Tests of this kind were used in Experiment 1 and Re-run, the Re-run of Experiment 2, Experiment 3 and the second Re-run of this, and Experiment 4. Free recall was used in preference to verbatim recall on the grounds that, as stated previously, students seldom have to remember the exact words of their study texts, but do have to remember the content. Poetry and play scripts are obvious exceptions to this general statement.

Carroll remarks that free recall, which he terms 'paraphrase', may be a useful technique for measuring comprehension 'if (it) can be objectively and validly scored' (Carroll, 1972: p. 23). Carroll thus raises two queries about this form of test, namely whether the scripts can be objectively scored, i.e. whether two or more markers will arrive at the same score for a script, and secondly, whether the scoring scheme can be made valid, i.e. whether the scoring scheme accurately reflects the information contained in the text to be recalled. These points must be dealt with separately.

3.3.3.1. Validity: The marking schemes drawn up for the recall tests

/were

were in each case based on the textual analyses done prior to the experiments. In Experiments 1 and 2, for example, each unit into which the text had been decomposed in the course of the analysis (cf. Chpts. 4 and 5) served as units in the marking scheme. At least to some extent, therefore, if the analysis was accurate, then the scoring scheme based on it was also valid. The schemes tended to reflect the main aim of the experiments. For example, in Experiment 1, which was concerned with the organization of statements describing events in time, the scoring scheme concentrated on the recall of such statements. It is true that a lot of other information contained in the text was ignored. For example, the passage about Everest (cf. Chpt. 4) contained the information that Everest was 28,260 ft. high. This was not included in the scoring scheme since it was not relevant to the sequence of events. It might be argued that this was unfair to subjects who recalled the height of the mountain, but since this applied equally to both groups in the experiment, it is not likely to have affected the overall result.

A recall script was awarded a point if it contained a segment which was considered sufficiently similar in meaning to a particular unit in the text. On the whole, these units were statements. A reasonable criticism of such schemes is that they appear to treat texts as consisting of strings of statements, and the total meaning of the text as consisting of the sum of these statements. That is, they ignore the relationships between units of the text. This was done, however, for convenience of scoring. The assumption was made that a superior organization of a text would result in each individual statement in the text being easier to recall.

3.3.3.2. Objectivity: In this series of experiments, when independent

/markers

markers were used as check on the experimenter's scoring, the correlation between marks was high, between .88 and .97. It seems that objectivity in marking free recall scripts is not unattainable, or even particularly difficult to attain, given an explicit enough scoring scheme.

Carroll (1972: 23) suggests that by forcing subjects to use their own words, free recall tests may put an extra burden on them. In the recall tests used here, however, subjects were instructed to write down everything they could remember of the text. They were told that if they could not remember the exact words, they were free to use their own. Thus they had a choice of using either free or verbatim recall. There was no question of them being 'forced' to use their own words. Free Recall proved to be quite a sensitive test, producing significant results in Experiment 1, and its Re-run, the Re-run of Experiment 2, and in part of Experiment 3.

3.3.4. Guided Recall: This was used only once, in the 1st Re-run of Experiment 3. Basically, it consisted of producing a paraphrase of the text to be recalled, then deleting large sections of this paraphrase and asking subjects to restore the deleted material. It is discussed in detail in the account of Experiment 3.

3.3.5. Open-Ended Questions: These were used only in Experiment 4, first to try and make the Intrusive Word Test more sensitive by cueing subjects beforehand, then later as a test of Recall in their own right. They are discussed in detail in the relevant section of Experiment 4.

3.4. Experimental Design: In view of the fact that each member of a pair of Experimental Passages had a lot in common with the other member,

/and

and in most cases, in fact, was a paraphrase of the other member, a Repeated Measures design was ruled out. The learning effect would have been too strong. Therefore the designs used were either an Independent Subjects design, (Experiments 1 and Re-run, 2 and Re-run) or a Matched Pairs Design (Experiment 3 and both Re-runs, Experiment 4). The criterion used for matching the pairs in the second design was the subjects' marks in either English exams or English class tests. It must be admitted that a considerable proportion of such marks may have been gained from activities other than reading comprehension. Still, in most cases, reading comprehension formed about 60% of the possible total mark.

3.4.1. Randomization: In the Independent Subjects design, subjects were randomly assigned to one or other of two groups. This was done in the class-room. There was no question of this being affected by the experimenter's subjective judgement (v. Cox, p. 78) since none of the subjects were known to him. In the Matched Pairs design, subjects were first matched on the basis of exam or test marks, then each member of a pair of subjects was allocated to one or other of two groups on the toss of a coin. In Experiments 1, 2 and the Re-run of 2, one group of subjects read texts 1A and 2A, while the other group read 1B and 2B (that is, one group read the 'experimental' version of each pair, while the other group read the 'control' version). In Experiment 3 and both Re-runs, Experiment 4, and the Re-run of Experiment 1, one group read 1A and 2B, while the other group read 1B and 2A. This was to guard the results from being affected by one group accidentally containing significantly more able subjects than the other.

3.4.2. Level of Statistical Significance: The level of significance

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accepted was 5%. In most cases, the experimental hypothesis was treated as being one-tailed, since the direction of the difference in means was predicted. In Experiment 3, the direction was not predicted, and the hypothesis was regarded as being two-tailed.

CHAPTER 4

NATURAL PRINCIPLES OF ORGANIZATION

A. CHRONOLOGICAL ORDER

4.1. Introduction: One of the seemingly simpler forms of textual organization is that referred to by rhetoricians and others as 'chronological' or 'time' order. In accordance with this principle, events or processes are described in the order in which they occur in time. That is, the event which happens first in time is described first in the linear ordering of the text, the second event is mentioned second, and so on. Let us suppose, for example, that John's activities one day can be divided into three main episodes, namely, (a) going to town (b) buying a packet of cigarettes (c) walking along the High Street, and that these activities happened sequentially in the order, 'a' then 'b' then 'c'. Then a chronologically ordered text describing these activities might be organized as:

> 'John went into town. He bought a packet of cigarettes. He walked along the High Street.'

or as,

> 'After going into town, John bought a packet of cigarettes, then walked along the High Street.'

There are several other possibilities. However, if chronological order were being followed, then the text would not be organized in the following way:

> 'John went down town. Before walking down the High Street, he bought a packet of cigarettes.'

Chronological order is the textual organization favoured by the rhetoricians for narrative purposes. Thus McCrimmon describes it as

/'natural

'natural for narration' (McCrimmon, 1963: 77). Hodges and Whitten add that it is normal for a text explaining a process (Hodges and Whitten, 1962). Lackstrom, Selinker and Trimble claim that this order is 'virtually forced' on the scientific writer in certain circumstances (Lackstrom, Selinker and Trimble, 1972: 8).

As a principle of organization, chronological order seems a suitable one to begin with for three reasons:

1. It is quite typically found in the study texts which are the principle interest of this study. Historical narratives, descriptions of scientific processes, etc., all provide opportunities for using this order.

2. This form of organization is comparatively easy to analyse. Within limits, most people will agree as to whether event 'a' preceded or followed event 'b'. Since there is likely to be general agreement on which clause follows which in a text, the problem of whether the order of clauses parallels the order of events seems a fairly simple one to resolve.

3. It appears to be the case in English that in the absence of any overt marking of Time relationships, events are interpreted as having happened in the order in which they are described. For example, the sentence,

'He got up and lit a cigarette'

is taken to mean that he <u>first</u> got up <u>and then</u> lit a cigarette. A similar meaning results when the two clauses are not conjoined by 'and' but form contiguous sentences.

This will be gone into in more detail when the writings of certain

/grammarians

grammarians are discussed below. Clearly, however, if the claim made here is valid, then it is relevant to a study of chronological organization, since it means that the writer's choice of ordering is affected in an obvious way by a particular feature of the language. The way in which the interpretation of clause order is linked to the sequential order of events being described reinforces the choice of a particular type of textual organization. Not all forms of textual organization receive this kind of reinforcement. It is unlikely, for example, whether anything definite can be gathered from the order of clauses describing objects in space about the position of these objects relative to each other.

The remainder of this chapter is divided into three sections. The first consists of an account of the work done by certain modern grammarians on chronologically ordered structures conjoined by 'and'. The second section describes some psycholinguistic research into two related areas concerning chronological order, namely, whether such an ordering inside sentence boundaries is acquired by children earlier than equivalent non-chronological structures, and secondly, whether chronological structures are easier for adults to understand than their non-chronological equivalents. The third section reports an experiment in which chronologically-ordered extended texts were compared for readability with equivalent non-chronologically-ordered texts.

4.2. Grammatical Approaches: Recently some of the generative semanticists have discussed the meaning of 'and' when it conjoins two time clauses. One of the main problems is that while a sentence such as,

'He was laughing and singing'

means the same, in all obvious respects, as the sentence,

'He was singing and laughing',

/a

a sentence such as,

'He got up and lit a cigarette'

does not mean the same as the sentence,

'He lit a cigarette and got up'.

In the first example, in which the order of the two clauses can be reversed without the meaning being altered, 'and' is said to be used symmetrically, while in the second example, it is used asymmetrically. Lakoff and Peters (1969) suggest that asymmetric 'and' means 'and then', and is derived from a deep structure,

S and S1 after it (S).

The 'after it (S)' would later be deleted.

Robin Lakoff (1971) objects that 'after' is not fully analysed and contains elements of 'and', and that Lakoff and Peters' argument is therefore circular. A more obvious objection is that the suggested deep structure appears to be merely an ad hoc spelling out of the meaning of the surface structure. There is nothing in the account to explain which conjuncts will appear with asymmetric 'and' and which with symmetric 'and'.

McCawley (1971) attempts to deal with the problem in a quite different way, since he wishes to avoid having two different meanings of 'and'. He argues that 'tense' should be regarded as a verb, and that this verb refers to the time of the clause which the verb is in. In narrative chains, ie. strings of conjuncts referring to consecutive events, each past tense refers to a time shortly after the time referred to by the tense of the previous verb. That is, each conjunct supplies the time reference for the tense of the verb in the subsequent conjunct.

/McCawley

McCawley goes on to claim that the tense verb refers to time in a manner analogous to the way in which pronouns refer to their noun referents. With regard to pronouns, Langacker (1969) has pointed out that, in separate conjoined structures, the pronoun must follow its noun referent, eg. the sentence,

'Penelope slandered him and cursed Peter'

is ungrammatical, given the condition that 'him' refers to 'Peter'.

McCawley applies this argument to the tense verb. In narrative chains, such as,

'The Lone Ranger broke the window, took aim and pulled the trigger',

in which each clause is a separate conjoined structure, the first conjunct supplies the time reference for the tense verb of the second conjunct, and hence the first conjunct must precede the second, and the second precede the third.

McCawley's account constitutes a claim that, in the absence of any overt time markers, a conjunct describing one event must, for syntactic reasons, precede a conjunct describing a subsequent event. Whatever its merits, the argument does not seem capable of explaining why some conjoined structures are interpreted as describing consecutive events, while others, sometimes containing the same verbs, are interpreted as describing events happening simultaneously. That is, it does not explain, for example, why the sentence,

'The baby lay in its pram and laughed, kicked, and squealed with pleasure'

is probably to be interpreted as describing simultaneous actions, while

/the

the sentence,

'John sat back in the chair and laughed at Mary, and she kicked him and he squealed in agony'

is interpreted as a series of consecutive events.

Robin Lakoff (1971) tries to account for the problem in terms of (1) topics common to each conjunct, and (2) 'presuppositions'. According to her, 'and' joins conjuncts which have a common topic, this consisting of a element which is identical in each conjunct. Thus, the conjuncts in the sentence,

'John eats apples and his brother drives a Ford'

share the topic 'John', since John's brother has 'something to do with' John. If the conjuncts do not appear to share such a common topic, then one must be supplied by a 'presupposition'. Thus, the sentence,

'John wants to make Peking Duck and I know that the A. & P. is having a sale on Hoisin sauce'

requires that the listener supply the presupposition that hoisin sauce is used for making Peking Duck. Since such presuppositions obviously depend on the general knowledge of the listener, Lakoff has to admit that sentences may be more 'acceptable' to some listeners than to others (p.120).

Turning to asymmetric 'and', Lakoff offers two arguments which she does not appear to differentiate. The first is that in such cases, the first conjunct is 'presupposed' by the second. Thus in the example,

'The police came in and everyone swallowed their cigarettes and Bill choked on his..'

the statement that everybody swallowed their cigarettes 'presupposes'

/that

that the police came in, since to state the second but deny the first is to render the sentence 'bizarre' (p. 128). This appears to amount to a claim that not only must there have been a reason for everyone to swallow their cigarettes, but that only one possible reason exists, namely the entry of the police. Whatever may be said in favour of this argument, it hardly seems to deal with facts about language, or in particular, grammar.

Lakoff's other argument, which at first sight seems more plausible, is that in the case of asymmetric 'and', the listener supplies a presupposition that the first conjunct either caused the second, or preceded it in time. Thus the sentence,

'Harry pressed a button and 8,000,000 people died'

is rendered 'acceptable' if the listener presupposes that event 1 <u>caused</u> event 2.

The following criticisms can be made of Lakoff's argument:

1. As Kempson (1973) points out in a very critical review, Lakoff's use of presuppositions is so vague and all-inclusive as to be virtually useless. Lakoff often appears to use the term as equivalent to 'assumption'. Thus she claims that 'John has a Ph.D. in linguistics' presupposes that John can read and write. But if we make such an assumption, we do it by virtue of our knowledge of the world.

2. Kempson also points out that the result of appealing to such assumptions - often, in Lakoff's case, assumptions shared by only a minority of speakers - in order to decide on the grammaticality of sentences, is to render the grammar non-predictive.

/3.

3. Lakoff's argument seems incapable of handling the problem of asymmetric 'and' in her own terms. She implies that we only resort to presuppositions when there is no overt 'topic'. But in that case, the sentence, 'Harry drove off in his car and robbed a bank' requires no presupposition to justify the conjunction, since the conjuncts share an obvious common topic in Lakoff's terms, either 'Harry', or 'What Harry did'. Hence a presupposition of temporal priority is here supplied in addition to the topic it was meant to provide.

On the other hand, if a presupposition of the temporal priority of one conjunct is sufficient to make a sentence acceptable, then the sentence,

'The police came in and everybody swallowed their apple-sauce'

is just as acceptable as

'The police came in and everybody swallowed their cigarettes',

although Lakoff, relying on presuppositions of causality, considers the first as 'relatively less grammatical' than the second (p. 130).

4.2.1. 'And' as a Marker of Discourse Relationships: Kempson suggests that since the sentence 'The Lone Ranger mounted his horse and rode away' contains the same time relationships between conjuncts as 'The Lone Ranger mounted his horse. He rode away', 'and' is best handled as marking a discourse relationship. She cites Grice (1968), who has argued for the notion of 'Conversational Implications' in speech. Grice suggests a 'Cooperative Principle' in discourse, operating in such a way that 'each participant in (talk-exchanges) recognizes in them, to some extent, a common purpose or set of purposes' (p. 6). He then introduces a group of maxims, related to the Cooperative Principle, one of which is 'Be Relevant'. In accordance with this maxim, the listener, faced with the

/sentence,

sentence,

'Harry pressed a button and 8,000,000 people died'

will assume that both conjuncts are relevant to the discourse, and that their conjunction is also relevant. In this case, a likely interpretation of this relevance will be that the first event caused the second.

4.2.2. Rules for the Discourse Interpretation of Asymmetric 'And': There is still the problem that 'and' is sometimes interpreted as being symmetric, and sometimes as being asymmetric. The following rough rules are probably sufficient to account for the different interpretations:

1. Given two consecutive statements (clauses, sentences) in a narrative, both of which describe single events, and
2. Given that neither contains any explicit marking of time relationships such as would indicate a different time sequence, then
3. Either they are interpreted as happening simultaneously or the 1st event described is taken as having preceded the second in time, and
4. If the second interpretation above is selected, and if the nature of the events described is such as to allow the interpretation of a cause-effect relationship between them, then the 1st event is taken as having caused the second.

It is likely that a great deal depends on the meaning of individual verbs, and on our knowledge of the world.

/4.3.

4.3. Psycholinguistic Research: Two related areas of research are discussed here. There is first the question of whether sentences exhibiting a chronological order of clauses are acquired earlier than sentences with a non-chronological order. Secondly there is the question of whether such chronological sentences are easier for adults to understand. Most of the psycholinguists mentioned below have also discussed whether sentences beginning with a subordinate clause of time are harder or easier than equivalent sentences beginning with a main clause.

4.3.1. Children's Acquisition of Chronological Sentences: Eve Clark (1970) investigated children's acquisition of two-clause sentences referring to ordered events in time. The subjects were fifteen nursery-school children aged between three and three and a half. Their spontaneous utterances were studied over a period of six months.

In English, such two-clause sentences can take the following forms:

(i) Clause + 'and' + Clause

(ii) Main Clause + Subordinate Clause

(iii) Subordinate Clause + Main Clause.

At the time of this study, Clark considered that there were three principles governing adults' choice of one or other of the above structures, namely,

1. Time Order: She claimed that the 1st event-1st mention order is simpler and 'unmarked', and is hence preferred by adults.

2. Derivational Simplicity: In transformational grammars, sentences of the type,'Subordinate Clause + Main Clause' are generally derived, by an optional transformation, from strings in

/which

which the Adverbial appears on the right of the verb. They are thus more complex, and hence, the argument went, more difficult, than sentences of the type, Main Clause + Subordinate Clause.

3. Choice of Theme: Clark saw this principle as characterising the speaker's decision to talk about ONE of the two events first.

Clark hypothesized that the children would begin with simple sentences or with the 'Clause + 'and' + Clause' form, in both cases adhering to chronological order. The second stage would be brought about by their wishing to thematize the second event, that is, to mention the second event first. If constructions like 'X but first Y' are ignored, this decision would involve the children's using sentences with subordinate clauses. By the principle of Derivational Simplicity, the form chosen would be 'Main Clause + Subordinate Clause', eg. 'He lit a cigarette when he sat down'. Finally, in stage 3, the children would use the form, 'Sub. Clause + Main Clause' to talk about the first event first, eg. 'When he sat down, he lit a cigarette', the advantage of this form over the co-ordinate structure being greater explicitness of time relationships.

The argument depends in part on the children acquiring subordinate clauses beginning with 'when' before clauses beginning with 'before', since otherwise the motivation to move from Stage 2 to Stage 3 is lacking. Clark did, in fact, find that 'when' appeared earlier than either 'before' or 'after'.

Results: On the whole, the results of the study confirmed the hypothesis.

/That

That is, the children moved from Stage 1, (Clause + 'and' + Clause) to Stage 2 (Main Clause + Sub. Clause) to Stage 3 (Sub. Clause + Main Clause). A certain number of the children had, however, arrived at Stage 2 when the study began.

In contrast to these findings, Ruth Clark, who has conducted a sustained study of her two children's language acquisition, reports that utterances deviating from chronological order are very frequent among the early time expressions. She also reports that occurrences of the structure 'Sub. Clause + Main Clause' with 'after' as the conjunction are quite common in the data (Clark, 1974).

Again, while Eve Clark's findings suggest that children move from an initial reliance on chronological order in Stage 1 to a second stage in which thematization of the second event becomes important, Bever reports a study which appeared to show that children between the ages of 2 and 4 become increasingly dependent on time order (Bever, 1970).

It appears, in fact, as if many more child studies will have to be carried out before it is possible to come to a conclusion as to whether chronological order of clauses is acquired first.

4.3.2. Adult Recall: In a later study, H. H. Clark and Eve Clark studied the effects of the different forms for expressing time relationships on adults' ability to recall sentences (Clark and Clark, 1968). They used six sentence forms (S1 = the clause describing the 1st event.
S2 = the clause describing the 2nd event.)

1. S1 'before' S2.
2. S1 'and then' S2.
3. 'After' S1, S2.

/4.

4. S2 'after' S1.

5. S2 'but first' S1.

6. 'Before' S2, S1.

The Clarks now talk about <u>two</u> principles affecting memory for sentences, the first being order of mention, the second the relative order of clauses, that is, Main + Sub. or Sub. + Main Clause. Thus derivational simplicity has been dropped, partly because the Clarks specifically wanted to show that memory for sentences had a semantic, not syntactic basis. On the other hand, Eve Clark's original 'thematization' principle has been replaced by a syntactic principle of clause order.

The sentence forms used form two sets of opposed pairs, namely

1. Order of Mention:- 1st-event-1st v 2nd-event-1st (1,2,3, v 4,5,6)

2. Clause Order:- Main Cl. + Sub. v Sub. Cl. + Main Cl. (1,4 v 3,6)

The subjects, American college students, were given each sentence on a card accompanied by a noun cue. After reading six sentences, they tried to recall the sentences verbatim in writing on being given the cues. The Clarks used two scoring measures. They counted the number of times the meaning of a sentence was successfully recalled, regardless of the syntactic form. This gave a measure of the 'comprehensibility' of each sentence. They also counted the number of times subjects chose a particular form with which to recall the sentences they had read. This was a measure of the 'popularity' of each sentence type. The results are as follows:

1. 1st-event-first sentences were significantly more comprehensible

/and

and also more popular than 2nd-event-first sentences.

2. The Main Cl. + Sub. Cl. sentences were significantly more comprehensible and more popular than forms beginning with the Subordinate Clause.

To account for these results, the Clarks claim that S2-S.1 sentences are 'marked' in relation to the 'unmarked' form, S.1-S.2, and similarly, that sentences of the form, 'Sub. Clause + Main Clause' are again marked forms. Marked forms, they claim, are more difficult to recall than unmarked forms. Hence sentences like, 'He lit a cigarette before he sat down' are unmarked both in respect of Time order and of Clause order, and should be easy, which the results, in fact, showed them to be, while sentences such as 'Before he sat down, he lit a cigarette', which is marked both for Time and Clause order, should be the most difficult, which again agrees with the results of the experiment.

However, this appeal to the linguistic concept of marking seems very dubious. It is not at all clear what either type of marked form is actually marked <u>for</u>. In the case of the form S.2-S.1, it is just possible to argue that by starting with the 2nd event, the speaker emphasizes the relative importance of this event, and that this constitutes the marking, but this is very doubtful. In the case of the form 'Sub. Clause + Main Clause' not even this explanation is available. The Clarks fall back on equating 'unmarked' with 'most frequent', claiming that in determining marked and unmarked forms, linguists have relied on 'an impressionistic judgement of frequency of usage' (p. 137). However, it is doubtful whether this equation would be accepted by many linguists (cf. Lyons, 1968: p. 79).

It seems best, therefore, to confine oneself to the facts that the

/Clarks

Clarks appeared to find, namely that chronological order was remembered better than non-chronological order, and that sentences beginning with the main clause were easier to remember than sentences beginning with the subordinate clause.

4.3.3. Adult Comprehension: Smith and McMahon (1970) investigated roughly the same area, again using adult subjects. They used four sentence types:

1. S1 before S2
2. S2 after S1
3. Before S2, S1
4. After S1, S2

That is, they used the same sentence types as the Clarks, but omitted the co-ordinate forms. The main difference between their experiments and the Clarks' was that subjects, rather than reading the sentences and then attempting to recall them in writing, read the sentences on a screen and answered the questions 'What happened first?' or 'What happened second?' orally.

There were three versions of the basic experiment. In the first, the questions were presented before the subject saw the sentence. In the second version, questions were presented after the subject had seen the sentence. The third version differed from the second in that, between reading the sentence and being presented with the questions, the subject performed a short 'interference' task.

Results: In several respects, their findings appear to conflict with those of the Clarks. With respect to Time order, in Experiment 1, S.2-S.1 sentences took significantly LESS time to answer than S.1-S.2

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sentences. In Experiment 2, in which subjects first inspected the sentences, and were then given the questions, S.2-S.1 sentences required significantly LESS inspection time, although response time for them was significantly longer. In Experiment 3, in which subjects performed a short interference task between reading the sentence and being presented with the question, there was no significant difference between S.2-S.1 sentences and S.1-S.2 sentences.

As far as Clause order was concerned, the form 'Sub. Clause + Main Clause' took significantly LESS response time than 'Main Clause + Sub. Clause' in Experiment 1. However, in Experiment 2, sentences beginning with the Subordinate clause did result in more errors. In Experiment 3, there was no significant difference between the two forms.

Other findings are summarized below:

(i) The question 'What happened second?' required more response time than the question 'What happened first?' (Experiments 1, 2 and 3).

(ii) Questions whose answer was contained in the subordinate clause required a longer response time than sentences whose answer was contained in the main clause. (Experiment 1).

(iii) Sentences with 'after' required more response or inspection time than sentences with 'before' (Experiments 2 and 3).

Smith and McMahon also tried replicating the Clarks' experiment and got the same results as the Clarks. They admit to being in the dark about the processes lying behind their own experimental results but suggest the following explanations:

(i) Different types of test-task will produce different, and

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possibly contradictory results.

(ii) In particular, a test of verbatim recall will produce different results to those produced in answer to comprehension questions. They suspect that order of mention does not have much of an influence on understanding, but has an interfering effect on memory (p. 269).

(iii) Laboratory comprehension experiments tend to be overly artificial. They point out that using lists of sentences, all of them confined to a very few sentence types, and asking subjects to perform very simple tasks, may result in subjects employing highly specialized strategies.

4.3.4. Bever's 'Presupposition' Theory: Bever (1970) attempts to reconcile the Clarks' finding that order of mention and clause order both affected subjects' ability to remember sentences with the finding of Smith and McMahon that

(i) neither order of mention nor clause order had a consistent effect on comprehension

(ii) the question 'What happened first?' was easier to answer than the question 'What happened second?'

(iii) questions requiring the main clause as an answer were easier than those requiring the subordinate clause

(iv) sentences with 'before' were easier than sentences with 'after'

Bever claims that in the sentences used by the Clarks, and by Smith and McMahon, the main clause is an assertion, containing new information, while the subordinate clause is a 'presupposition', containing background

/information

information. As a test for 'presuppositions', he suggests transforming the sentence into a question, and then assessing the effect of denying the truth of each clause separately. If the effect of denying the truth of a clause is to deprive the question of any possible answer, then that clause is a presupposition. For example, if we change, 'The elephant jumped before he walked' into 'Did the elephant jump before he walked?', then we can deny the first clause of the statement, and the answer to the question is 'No'. But if we deny that the elephant walked, then the question has no answer. Hence 'The elephant jumped' is an assertion, whereas 'The elephant walked' is a presupposition.

He then sets up three principles according to which listeners organize clauses:

1. presuppositions are psychologically subsidiary to assertions.
2. we organize events starting with event 1.
3. all things being equal, we prefer clause order to follow temporal order.

(Principle 3 is that already proposed here, p.69 , as a principle of English discourse. 2 is very similar. Principle 1 is a new idea.)

His theory can then be used to explain Smith and McMahon's finding that questions requiring the main clause as answer were easier than those requiring the subordinate clause (Principle 1, the subordinate clause in the examples under discussion being 'presupposed'), and also that 'What happened first?' questions were easier than 'What happened second?' ones (Principle 2). The fact that 'before' sentences were easier than those with 'after' can be explained by a combination of principles 1 and 2.

/In

In 'before' sentences the 1st event, the one preferred for starting with, is described by the psychologically dominant assertion. In 'after' sentences, however, the (preferred) first event is contained in the (psychologically subsidiary) presupposition.

Bever goes on to claim that the Clarks' results, in which the dominant principle seems to be temporal ordering were the result of the fact that Principle 1 weakens quickly in memory and is replaced by 2 and 3 after some time. Thus the Clarks' subjects, after a time, would forget their organization in terms of assertion and presupposition, and fall back on temporal ordering. Then those sentences which reflected temporal order would emerge as being easier to remember, just as the Clarks found.

There is, unfortunately, a flaw in this argument. Bever claims that Principle 1 becomes less important when the recall period is an intermediate one of between 20 minutes and 3 hours. The Clarks' subjects read and recalled sentences in batches of 6, being allowed 10 seconds to read each one. Even allowing for a generous amount of writing time, it seems likely that the recall period was closer to 5 than to 20 minutes.

Bever's theory is intriguing, however, and deserves some discussion. It is unfortunate that he uses the term 'presupposition' since this term is employed by linguists in a number of ways, none of which coincide exactly with Bever's use (Keenan, 1971). In fact Bever's distinction between assertions and presuppositions seems closest to Halliday's distinction between 'given' and 'new' information (Halliday, 1970). If this is so, however, it is not the case, as Bever implies, that in Time

/sentences

sentences consisting of a main clause and a subordinate clause, the main clause always contains new information, whereas the subordinate clause contains background, given information. In some cases, the information in both clauses is given, eg.

'He drank the beer before he went to bed'

with the tonic on 'before'. In other cases, the information in both clauses may be new, eg.

'The plane was landing at Rabat airport when it was suddenly attacked by jet fighters'.

Moreover, Bever's test for presuppositions breaks down in the case of the second sentence, since to convert it into a question, 'Was the plane landing at Rabat airport when it was suddenly attacked by jet fighters?' is to make the subordinate clause appear to contain given information, whereas this was not the case in the original statement.

Whether or not Bever's general case is valid, it requires a much more precise statement of what he means by 'Presuppositions' before it can be tested. Moreover, it seems likely that an explanation of comprehensibility in terms of new and background information requires to be tested using extended texts, since, at least in the written language, individual sentences are often ambiguous with regard to what is new and what is background in the information they contain.

4.3.5. Conclusions: The Clarks found that chronological order facilitated recall, while Smith and McMahon found that it had virtually no effect on comprehension. Contradictory findings also emerged on the question of whether sentences beginning with the main clause were easier or harder to comprehend than those beginning with the subordinate clause. Bever

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produced an interesting explanation to account for the differences in the findings, but it is not altogether clear whether his terms are sufficiently well defined to permit his theory to be tested objectively and validly.

It seems likely that if some form of the 'given/new' distinction is to be introduced into experiments, then a context must be provided, since the syntax does not signal the distinction unambiguously.

4.4. Experiment 1. Chronological v Non-Chronological Texts: The aim of the experiment was to determine whether a chronological form of organization enhanced the readability of a text describing a sequence of events. For this purpose, 2 pairs of texts were constructed. Each member of a pair contained the same factual information as the other member, the two differing in that one was organized chronologically, the other non-chronologically. The hypothesis was that the chronological versions would be more readable than their non-chronological equivalents.

4.4.1. Construction of Experimental Texts: Two Primary Passages were selected (cf. Chpt. 3 for an explanation of the terms used to describe various stages in the production of the texts), which, after the processes described below, resulted in two pairs of Experimental Texts, 1A and 1B, and 2A and 2B.

4.4.1.1. Passage 1: 'Cavebuilding': The Primary Passage was taken from "A Higher Course in English Study 1" by Mackin and Carver (Mackin and Carver, 1968: pp. 40 and 41). The Pre-Experimental Text was composed from the first two sentences of paragraph 2, p. 40, and the first seven sentences of paragraph 1, p. 41. The only other modifications consisted

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of changing the presumably Chinese unit of measurement 'chi' into 'feet', and changing the word 'loessial' in the phrase 'loessial earth' to 'firm'. Both these changes were carried out to simplify the text. The Pre-Experimental Passage that resulted is given below:

Pre-Experimental Passage 1:

There are two kinds of cave: earth ones and stone ones. The earth caves are dug into the hillside. Having selected a place where the earth seems to be of the right kind, you smooth the hillside so that you have a vertical face. In doing this, you will see what the soil is like to work with. Next, you make a first hole of two by seven feet and dig in for roughly three feet before you start enlarging. As you dig, the kind of soil will show you how large you can make the cave. The harder and closer the soil is, the larger you can make your cave and vice versa. Having dug out your cave, you polish the earth walls to make them smooth, then you plaster them with mud made of firm earth. All this time, you leave the outer wall untouched, using just the little opening that you made at the beginning, but once the cave is finished you open up this wall so that you have a door and a window.

It can be seen that this text is not, strictly speaking, a narrative, but rather a description of the stages in a process, or even a set of instructions. It is, however, suitable for the purpose of this experiment in that the processes it describes are carried out in chronological order.

4.4.1.1.1. Decomposition into Units: For the purposes of analysing the text, of constructing a parallel experimental version, and of marking recall scripts, it was necessary to decompose the Pre-Experimental

/Passage

Passage into a number of relevant units. In the context of this experiment, a relevant unit was a part of the text that described a single event or stage in the process. It was often the case that the part in question was embedded in a larger sentence, so that one sentence might contain two or more relevant parts. In such cases, various processes associated with embedding - deletion of elements, pronominalization etc. - often obscured the parts. It was therefore thought desirable to take each relevant part and rewrite it as an independent sentence.

For this purpose, an informal transformational approach was used. Structures in the text that described distinct stages in the sequence were identified, and, when necessary, re-written as independent sentences. This normally involved substituting for an embedded structure a complete sentence having the same underlying string as the embedded sentence. Thus, a sentence,

'You dig in for roughly three feet before you start enlarging'

would be decomposed into the two units,

1. You dig in for roughly three feet.
2. You start enlarging.

The time relationship holding between the two units could, of course, be found by reference to the original text.

A sentence which contained only one structure referring to a stage in the process was left untouched. Thus a sentence like,

'The mountain being 28,000 ft. high, the party took 2 weeks to climb it'

while containing an embedded sentence equivalent to 'The mountain was

/28,000

28,000 ft. high' was not decomposed, since the embedded sentence does not refer to an event or action. The whole sentence would thus be considered one unit.

For convenience, sentences containing no reference to events were assigned a unit number, although no attempt was made to decompose them.

4.4.1.1.2. Commitment to Truth in Decomposed Units: One difficulty of the syntactic process of decomposition is that not all the units thus obtained may carry the same commitment to truth on the part of the writer. For example, given a sentence like,

'John ordered Mary to go',

we are not justified in decomposing it into the units, (1) John ordered Mary. and (2) Mary went, even though it can be argued that the strings underlying the two decomposed units are the same as the strings underlying the original sentence. This is because, while the decomposed unit (2) unequivocally asserts that 'Mary went', this assertion is not made in the original sentence.

A way of dealing with this difficulty is to make use of some such concept as 'commitment to truth'. Bolinger has argued that a question such as 'What are you looking so happy about?' "supposes" the statement 'You are looking very happy'. (Bolinger, 1960). It can be claimed that by asking this question in a non-sarcastic manner, the speaker commits himself to the truth of the "supposed" statement. Similarly, by uttering the sentence, 'John ordered Mary to go', the speaker commits himself to the truth of the statement, 'John ordered Mary' but not of the statement, 'Mary went'.

The writer's commitment to the truth of separate propositions can

/thus

thus be used as a filter, after the syntactic process of decomposition has been carried out, to exclude structures to which the writer has not committed himself. Thus, the sentence, 'When John came, he didn't talk to anyone' will eventually yield 2 units, whereas the sentence, 'If John came, he didn't talk to anyone' will yield only one unit.

4.4.1.1.3. Decomposed Units: Below are the units into which the Pre-Experimental Passage 1 was divided. The units are given on the left; on the right are the structures in the text from which the units were derived. When no change was necessary in order to derive a unit from a text structure, the letters NC (No Change) appear on the right:

1.	There are two kinds of cave: earth ones and stone ones.	NC
2.	The earth ones are dug into the hillside	NC
3.	You have selected a place where the earth seems to be of the right kind.	Having selected a place where the earth seems to be of the right kind
4.	You smooth the hillside	NC
5.	You have a vertical face	so that you have a vertical face
6.	In doing this you will see what the soil is like to work with	NC
7.	Next, you make a first hole of two by seven feet	NC
8.	You dig in for roughly three feet	and dig in for roughly three feet
9.	You start enlarging	before you start enlarging
10.	As you dig, the kind of soil will show you how large you can make the cave	NC
11.	The harder and closer the soil is, the larger you can make your cave and vice versa	NC

/12.

12.	You have dug out your cave	Having dug out your cave
13.	You polish the earth walls to make them smooth	NC
14.	Then you plaster them with mud made of firm earth	NC
15.	All this time, you leave the outer wall untouched	NC
16.	You use just the little opening that you made at the beginning	using just the little opening that you made at the beginning
17.	You have finished the cave	but once the cave is finished
18.	You open up this wall	NC
19.	You have a door and a window	so that you have a door and a window

Comments:

(i) Some embedded structures which clearly refer to events have not been decomposed. In Unit 10, the structure 'as you dig' is derived from the same underlying string as the sentence 'you dig'. It was thought, however, that this referred to the same events as are described in Units 8 and 9, and that therefore it was unnecessary to decompose this structure. The same argument applies in the case of the structure 'in doing this' in Unit 6, which refers to the event described in Unit 4, and to the structure 'that you made at the beginning' in Unit 16, which is taken as referring to the same event as is described in Units 7 and 8.

(ii) It is possible that the structure 'to make them smooth' in Unit 13 should have been decomposed as 'You make the walls smooth'. It was left unchanged since there appeared to be some doubt as to the writer's 'commitment to truth' with respect to this proposition. In fact the rest of the text makes it fairly clear that he has so committed himself.

(iii) Unit 17 is a rather doubtful case. It has been decomposed on

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the assumption that the sentence 'the cave is finished' has the same underlying string as 'you have finished the cave'. Apart from this syntactic doubt, it is by no means clear whether 'finishing the cave' is a stage in the process on the same level as, for example, 'digging a hole'. One finishes, in fact, by performing another action, here by 'plastering the walls with mud'.

4.4.1.1.4. Functional Categorization of Units: It is obvious that not all the units in the text refer to events in time in the same way. Some refer to single events, others to processes taking place over an extended period of time during which several events took place, yet others do not refer to events at all. While it would be possible to classify the different types of unit quite informally, the form of analysis worked out by Labov and Waletzky (1968) (cf. 2.4.1.) provides a conveninent method of performing the analysis, and is used here. It is important to bear in mind that the analytical technique is here being applied to the decomposed units, not to the structures of the original text.

It will be remembered that Labov and Waletzky categorize the different types of clauses according to the amount of movement, or displacement they can undergo in the text without the interpretation of the sequence of events being altered. There are three main types of clause, namely,

1. Free Clauses, which can be moved anywhere in the text, although this sometimes necessitates changes in anaphoric reference, etc.

2. Restricted Clauses, which can be moved to a limited extent.

3. Narrative Clauses, which cannot be moved with respect to each other without the interpretation of temporal sequence being altered. Labov and Waletzky also mention Coordinate Clauses, which, with respect to one

/another

another, share the same amount of displacement.

Applying this analysis to the decomposed units of Pre-Experimental Passage 1, the following classification into clause types can be made:

A. Units 1 and 2 are Free Clauses.

B. Units 6, 10, 11, 15, 16, are Restricted Clauses. Unit 6 can be moved to a position immediately after Unit 4. The amount of displacement allowed to Unit 10 is slightly difficult to decide. Clearly it can be moved upwards in the text to a position immediately after the first reference to 'digging'. Thus it can be moved to follow either Unit 8 or Unit 7. As a third possibility, it might be moved upwards so as to follow Unit 4. If this is done, Unit 10 becomes virtually synonymous with Unit 6. An interesting fact that emerged from the Recall scripts is that subjects often did, in fact, treat Units 6 and 10 as virtually interchangeable.

Taken together, Units 10 and 11 form a relationship, not dealt with by Labov and Waletzky, which in this study is termed 'Assertion-Substantiation' (cf. Chpt 6). Unit 11 must follow Unit 10. Apart from that, it has the same displacement set as Unit 10, and the two clauses, in Labov and Waletzky's terms, are Coordinate. Units 15 and 16 are also Coordinate.

C. Units 4, 5, 7, 9, 13, 14, 17 and 18 are Narrative Clauses. As they stand, Units 3 and 12 are not, since, as Labov and Waletzky point out, the Perfect form of the verb has the effect of removing the clause from the strict Narrative sequence. In its present form, Unit 3, for example, can be moved to a position after Unit 4. Since, however, both units obviously refer to single steps in the process, it is

/desirable

desirable to treat both as Narrative Clauses. This is accomplished by altering the verb form to the Simple Present, 'You select a place' etc. Once this has been done, both Units 3 and 12 are seen to be Narrative Clauses.

4.4.1.1.5. Chronological Sequence in Pre-Experimental Passage 1: The Narrative Units are thus 3, 4, 5, 7, 8, 9, 12, 13, 14, 17 and 18. This is the order in which the structures corresponding to the units appear in the text of Pre-Experimental Passage 1. Reference to the Pre-Experimental Passage (cf. 4.4.1.1.) should also make it clear that it is also the order in which the events, or processes described by these units occur in time. That is, the order of mention of the Narrative Units in the Pre-Experimental Passage is a chronological one. This being the case, the Pre-Experimental Passage can without change be used as Experimental Passage 1A (Chronological).

4.4.1.1.6. Construction of a Non-Chronological Version: This involved altering the order of the Units, particularly the Narrative Units, and then applying processes of embedding, pronominalization etc, in order to construct a text of approximately the same length, same number of sentences, same readability index, and, of course, same content as the 'A' version.

The order of mention of the units chosen for the 'B' version was:

1, 2, 4, 5, 3, 6, 7, 8, 16, 15, 17, 19, 18, 9, 12, 10, 11, 14, 13.

Units 1 and 2, which function as orientation, remained in the same place. The position of the other units was altered as much as was thought possible. The text that was produced once embedding, etc., had occured, is given

/below:

below:

Experimental Passage 1B

There are two kinds of cave: earth ones and stone ones. The earth caves are dug into the hillside. You smooth the hillside so that you have a vertical face, having selected a place where the earth seems to be of the right kind. As you smooth, you will see what the soil is like to work with. Next, you make a first hole of two by seven feet and dig in for roughly three feet. All the time you dig, you will use just this little opening you made at the beginning, leaving the outer wall untouched. Once the cave is finished, however, in order to have a door and a window, you will open up this wall. You start enlarging, and dig out your cave. As you dig the kind of soil will show you how large you can make the cave. The harder and closer the soil is, the larger your cave can be and vice versa. Then, before plastering the earth walls with mud made of firm earth, you polish them to make them smooth.

Experimental Passage 1A is 178 words long, consists of 9 sentences, and has a Fog Index of 10.

Experimental Passage 1B is 179 words long, consists of 11 sentences, and has a Fog Index of 8.

Thus, while it is not really fair to the Readability measures to attempt to assign a readability index to such a small sample of text, on the criteria used by the Fog Index, the 'B' (non-chronological) version is easier than the 'A' (chronological) version.

4.4.1.2. Passage 2; 'Everest': The Primary Passage for this was taken from an article in the 'Scotsman' newspaper. Paragraphs 1, 2, 3 and 11

/were

were put together to form Pre-Experimental Passage 2. Paragraph divisions were eliminated. There were no other changes made. The Pre-Experimental Passage is given below:

Pre-Experimental Passage 2.

Extreme winds and persistent trouble with their tents forced the British Everest expedition to turn back 2,028 feet short of the 29,028 foot peak yesterday. Climbers from the team of 11 had been struggling to set up Camp Six on the previously unclimbed south-west face of Everest when atrocious weather set in, forcing the climb to be abandoned. The camp is the highest point that any climber has reached on the mountain in the autumn, and it was from there that Hamish MacInnes and Dougal Haston were to have launched their attempt on the summit. But furious winds made it impossible to keep the box-type tents in position, and completely ruled out any possibility of climbing the hazardous 2,000 feet to the top. The expedition arrived in Katmandu late in August, and set up base camp on the mountain early in September. Progress was quick until the weather delayed the setting up of Camp Five at 26,000 feet for several days. It was finally established on November 4, but from then on the climbers worked in 'incredibly severe weather' with temperatures around -40 deg. Fahrenheit, and wind that made every movement a struggle.

4.4.1.2.1. Decomposition into Units: The same process was carried out as had been done for Passage 1. In the case of this text there were fewer embedded structures to restore. The units, numbered in the order in which they appear in the Pre-Experimental Passage, are as follows:

/1.

1. Extreme winds and persistent trouble with their tents forced the British Everest expedition to turn back 2,028 feet short of the 29,028 foot peak yesterday	NC
2. Climbers from the team of 11 had been struggling to set up Camp Six on the previously unclimbed south-west face of Everest	NC
3. Atrocious weather set in	when atrocious weather set in
4. Atrocious weather forced the climb to be abandoned	forcing the climb to be abandoned
5. The camp is the highest point that any climber has reached on the mountain in the autumn	NC
6. It was from the camp that Hamish McInnes and Dougal Haston were to have launched their assault on the summit	and it was from there that ...
7. Furious winds made it impossible to keep the box-type tents in position	but furious winds ....
8. Furious winds completely ruled out any possibility of climbing the hazardous 2,000 feet to the top	and completely ruled out ...
9. The expedition arrived in Katmandu late in August	NC
10. The expedition set up base camp on the mountain early in September	and set up base camp ....
11. Progress was quick	NC
12. Weather delayed the setting up of Camp 5 at 26,000 feet for several days	until weather delayed ....
13. Camp 5 was finally established on November 4	it was finally established ...
14. From then on the climbers worked in incredibly severe weather, with temperatures around -40 deg.	

/Fahrenheit

Fahrenheit, and wind that made
every movement a struggle but from then on .....

4.4.1.2.2. Functional Categorization of Units: The simplest way of carrying out the categorization of clauses in this case is firstly to establish the relative time order of the units, and then assign them to categories. The chronological order of events appears to be as follows (figures refer to the position of the units in the time sequence, figures in brackets refer to the position in the text of the structures corresponding to the units):

1 (9). The expedition arrived in Katmandu late in August

2 (10). The expedition set up base camp on the mountain early in September

3 (11). Progress was quick

4 (12). Weather delayed the setting up of Camp 5 at 26,000 feet for several days

5 (13). Camp 5 was finally established on November 4

6 (14). From then on the climbers wored in incredibly severe weather ...(etc)

7 (2). Climbers from the team of 11 had been struggling to set up Camp 6 ...(etc)

8 (5). The camp is the highest point that any climber has reached ...(etc)

9 (6). It was from the camp that Hamish McInnes and Dougal Haston were to have launched their assault on the summit

10 (3). Atrocious weather set in

11 (7). Furious winds made it impossible to keep the box-type tents in position

12 (8). Furious winds completely ruled out any possibility of climbing ...(etc)

13 (4). Atrocious weather forced the climb to be abandoned

14 (1). Extreme winds and persistent trouble with their tents forced the British Everest expedition to turn back ...(etc)

It now becomes comparatively simple to assign each unit to its functional category.

A. Units 6, 8 and 9 are Restricted Clauses. The displacement range of Unit 6 is a trifle obscure. With modification of the deictic 'from then on' to some such expression as 'from Camp 5 on', the unit can be moved downwards to any position. One wonders why the writer, having said that from this point onwards, the weather was 'incredibly severe' says that, at a later point, 'atrocious weather set in'.

The reference in Units 8 and 9 'the camp' seems to make it necessary for these units to follow Unit 7. Apart from this, they can be moved downwards to any position.

If Unit 3 can be moved to a position immediately after Unit 1, it is a Restricted Clause. The meaning of the text is then that progress was quick from the time the party arrived in Katmandu. On the other hand, if it cannot be moved from its position after Unit 2, then it is a Narrative Clause. The meaning is then that the party made quick progress after they had established Base Camp.

B. Units 1, 2, 4, 5, 10, 11, 12, 13, and 14 are Narrative Clauses. As

/it

it stands, Unit 7 is not a Narrative Clause, since the continuous form of the verb allows the clause to precede or follow Unit 10. As with the Perfect forms in Text 1, however, the decision was taken to convert it into a Narrative Clause by altering the verb form to the Past Simple, 'struggled'.

4.4.1.2.3. Non-Chronological Sequence in Pre-Experimental Passage 2: The Narrative Units in Passage 2 are thus,

1, 2, 3(?), 4, 5, 7, 10, 11, 12, 13 and 14.

This order represents the chronological sequence of the events described. The order in which the textual structures corresponding to the Narrative Units appear in Pre-Experimental Text 2, is,

14, 7, 10, 13, 11, 12, 1, 2, 3, 4, 5.

It is thus clear that the text deviates in a very marked fashion from a chronological order. In fact, with the exception of Unit 14, which has been fronted to the very beginning, the text appears to consist roughly of two narrative chains, Units 7 to 12, and 1 to 5. What would have been the beginning of the complete narrative sequence has been transposed to the end.

It was considered that the order of elements in Pre-Experimental Passage 2 deviated sufficiently from a chronological order for the passage to be used unchanged as the non-chronological Experimental Passage, henceforth referred to as Text 2B.

4.4.1.2.4. Construction of Experimental Passage 2A (Chronological): This involved using the units to construct a text in which the sequence of textual structures paralled the chronological order of the events they

/described

described. The ordering of units chosen was

1, 2, 3, 4, 5, 6, 7, 10, 13, 8, 9, 11, 12, 14.

The only narrative Unit that is displaced from its strict chronological order is 13, which was retained in its original position alongside Unit 10 in order to keep the syntax in the re-written text as close as possible to that of the original.

The text that was produced from these units in the above order is as follows:

Experimental Passage 2A

The British Everest expedition arrived in Katmandu late in August, and set up base camp on the 29,028 foot mountain early in September. Progress was quick until the weather delayed the setting up of Camp Five at 26,000 feet for several days. It was finally established on November 4, but from then on the climbers worked in 'incredibly severe weather' with temperatures around -40 deg. Fahrenheit, and wind that made every movement a struggle. Climbers from the team of 11 were struggling to set up Camp Six on the previously unclimbed south-west face of Everest when atrocious weather set in, forcing the climb to be abandoned 2,028 feet short of the top. The camp is the highest point that any climber has reached on the mountain in autumn, and it was from there that Hamish MacInnes and Dougal Haston were to have launched their attempt on the summit. But furious winds made it impossible to keep the box-type tents in position, and completely ruled out the possibility of climbing the hazardous 2,000 feet to the top. The extreme winds and persistent trouble with their tents forced the

/expedition

expedition to turn back yesterday.

There were some minor changes made. The subject NP's of Units 1 and 9 were switched, and the position of one or two phrases was altered.

Passage 2A contains 191 words, Passage 2B contains 190. Both passages consist of 7 sentences. Both passages have a Fog Index of 16.

There were now two pairs of Experimental Passages, namely 1A and 1B (Cavebuilding), and 2A and 2B (Everest). In the case of both pairs, the 'A' version represented the chronological form of organization, the 'B' version represented the non-chronological. It is worth noting that in the case of the 'Cavebuilding' texts, it is the 'A' version that is closest to the Primary Passage, while in the case of the 'Everest' texts, it is the 'B' version that is closest.

4.4.2. Test Measures: It was decided for purposes of comparison to use both the Intrusive Word Test and Cloze Procedure for measuring speed. In effect, this resulted in there being two sub-experiments, in the first of which subjects were tested by means of the Intrusive Word Test and a Free Recall Test, in the second by Cloze Tests and Free Recall Tests. In order to avoid confusion, these sub-experiments will be discussed separately.

4.4.3. Sub-Experiment 1.

4.4.3.1. Subjects: 44 third year students from Portobello High School, Edinburgh, took part. They were drawn from two classes, both in the '0' stream, that is, the group who are expected to sit '0' level examinations the following year. Subjects were divided randomly

/into

into two groups, one of which did the 'A' (chronological) versions of the texts, the other the 'B' texts. There were 21 subjects in group 'A' and 23 in group 'B'.

4.4.3.2. Procedure:

(i) Intrusive Word Tests: 35 words were inserted into Texts 1A and 1B, and 20 words into Texts 2A and 2B. The tests are presented in Appendix 1. Subjects were first given an explanation of the test, and discussed an example. They were told that they were being tested for speed, and should work as quickly as possible, but that they were not, in fact, expected to finish. They were allowed 3½ minutes for Test 1, and 2½ minutes for Test 2.

(ii) Recall Tests: These were attempted after the Intrusive Word Tests. Subjects were told that they would be given a limited time to read the texts, (without the intrusive words), and would then have to write down everything they could remember of them. They were instructed that if they could not remember the actual words of the text, they were free to use their own. It was pointed out that mistakes in spelling, punctuation etc. would not be counted. They were allowed 1½ minutes' reading time for Text 1, and then around 6 minutes' recall time (this was not strictly timed). They were then allowed 2 minutes' reading time for Text 2, and again about 6 minutes' recall time.

4.4.3.3. Marking: The Intrusive Word Tests presented few marking problems. The only one that did arise was in cases where subjects underlined words belonging to the original text. It was decided to

/deduct

deduct marks only when a subject underlined more than 4 words of the original passage in any one line. In the event, only one subject was thus penalized.

The Recall scripts obviously presented greater scoring problems. For each pair of passages, a marking scheme was drawn up, based on the decomposed units. Details of these schemes are given in Appendix 3. Subjects scored one point for each unit they were judged to have recalled successfully. No marks were either awarded or deducted for the recall of the time relationships between units. For example, if a subject attempting to recall Text 1A wrote,

'You begin by making a door and a window'

he scored a point as having recalled Unit 19, 'You have a door and a window'.

4.4.3.4. Results: Mean scores for Sub-Experiment 1 are set out in Table 1 below. Actual scores are given in Appendix 2.

Table 1

	'A' Version	'B' Version
(i) Intrusive Word Test		
Passage 1	23.4	20.3
Passage 2	15	12.7
(ii) Recall Test		
Passage 1	6.8	7.2
Passage 2	5.7	4.2

In the Intrusive Word Test, Passage 1A was significantly easier

/than

than 1B at the 5% level (p .0401). Passage 2A was significantly easier than 2B, at the 5% level (p .0228). Thus in both cases, the chronological versions were significantly easier than the non-chronological versions.

In the Free Recall tests, the difference between Passage 1A and 1B is not significant. Passage 2A was significantly easier than 2B, at the 5% level (p .0073). Thus the chronological version of Passage 2 was significantly easier to recall than 2B.

4.4.4. Sub-Experiment 2: In this experiment, the Intrusive Word Test was replaced by two differing versions of Cloze Procedure. The Free Recall Tests were retained as in Sub-Experiment 1, and need not be discussed further.

4.4.4.1. Cloze Tests: A difficulty arises when one attempts to use Cloze to measure the comparative difficulty of two versions of a text. As is pointed out by Schlesinger (1968), if every 5th word is removed from each member of the pair, then different words will be removed from each member. On the other hand, if one removes the same words in each case, then the gaps will occur at different intervals. It is possible that either difference will affect the results.

It was therefore decided to try the effect of both methods of applying Cloze, that is, in one case removing every 5th word from both texts, in the other case, removing from one version of a text the same words as had been removed from the other version. This will be exemplified first with reference to Passage 1A (Cavebuilding).

Step 1: The 'A' version was selected as being closest to the Primary Passage. Every 5th word was deleted and replaced

/by

by a gap of a standard size. This produced Passage 1A (Standard Cloze).

Step 2: Every 5th word was deleted from Passage 1B, producing Passage 1B (Standard Cloze).

Step 3: From Passage 1B, the same words were deleted as had been deleted from Passage 1A. This produced Passage 1B (Modified Cloze).

There were thus three tests relating to Passage 1:

(i) 1A (Standard Cloze) (ii) 1B (Standard Cloze) (iii) 1B (Modified Cloze).

The same procedure was carried out for Passage 2. In this case, the 'B' version was used in Step 1, as being again the closest to the Primary Passage. The procedure again resulted in three tests, namely

(i) 2B (Standard Cloze) (ii) 2A (Standard Cloze) (iii) 2A (Modified Cloze).

A slight difficulty that arose when the modified Cloze Tests were being constructed was that, since Passage 1A differs syntactically from 1B, and similarly 2A from 2B, it was occasionally impossible to delete the same word as had been deleted in the original, since the particular word did not exist in the alternative version of the text. In such cases, a word judged to be syntactically similar, or of roughly equivalent predictability was deleted instead.

4.4.4.2. Subjects: 41 subjects took part in the experiment, drawn from 2 third year classes at Portobello High School. The classes were roughly equivalent academically to the two classes that took part in Sub-Experiment 1. The subjects were divided randomly into three groups, with 13 in the

/first

first group, 14 in the second and 14 in the third. The way in which the different tests were divided between the three groups is shown below:

Group 1	Group 2	Group 3
1A (Standard Cloze)	1B (Standard Cloze)	1B (Modified Cloze)
2A (Standard Cloze)	2B (Standard Cloze)	2A (Modified Cloze)

4.4.4.3. Procedure: Subjects were allowed 4 minutes to complete the first Cloze test, and 4½ minutes to complete the second. For the Recall tests, they were allowed 1½ minutes' reading time and 6 minutes' recall time for Passage 1, and 2 minutes' reading time and 6 minutes' recall time for Passage 2. Group 1 read the 'A' versions of the Recall tests, Group 2 the 'B' versions, and Group 3 the 'B' version of Passage 1 and the 'A' version of Passage 2.

4.4.4.4. Results: The mean scores in Sub-Experiment 2 are presented in Table 2 below. Actual scores are given in Appendix 2.

Table 2

Cloze Tests:	Group 1('A' texts)	Group 2('B' texts)	Group 3 (Texts 1B and 2A)
Passage 1	14.9	17	11.9
Passage 2	13.2	15.1	12.4
Recall Tests:			
Passage 1	3.5	3.6	4.3
Passage 2	3.8	2.8	3.4

None of the differences between 'A' and 'B' scores reaches significance

/level

level. It is likely that the division of the subjects into three groups resulted in these groups being too small.

4.4.5. Re-Run of Sub-Experiment 1: The Intrusive Word/Free Recall version of Experiment 1 was tried out again, this time at Inverness Royal Academy, in June, 1974, using a larger number of subjects.

4.4.5.1. Subjects: One hundred students, from classes 4A, 3A, 3B, and 3C took part. The third-year classes were all in the stream expected to sit 'O' level examinations the following year. The fourth year class had already sat 'O' levels.

4.4.5.2. Procedure: Each class was divided randomly into two groups. One group did the 'A' tests in the case of Passage 1, and the 'B' tests in the case of Passage 2. The other group did the 'B' tests of Passage 1 and 'A' tests of Passage 2. This method of increasing the amount of randomization had not been used in the original version of the experiment.

The amount of time allowed for each test differed slightly from the original experiment, and was as follows:

Passage 1 Intrusive: 2 minutes
Passage 2 Intrusive: 2 minutes
Passage 1 Recall: 2 minutes' reading time
Passage 2 Recall: 3 minutes' reading time

Apart from this, the procedure was the same as for the original experiment.

4.4.5.3. Results: Mean scores are given in Table 3 below. Means for each class are shown, together with the scores for each combined group. Actual scores are given in Appendix 2.

/Table 3

Table 3

Intrusive Test:	Text 1A	1B	2A	2B
Class 4A	26.5	24.9	20.3	19.5
Class 3A	27.4	20.0	17.8	19.0
Class 3B	15.9	15.3	16.6	14.7
Class 3C	24.4	24.0	17.4	17.4
Combined	23.75	21.1	17.4	17.4
Recall Tests:	**Test 1A**	**1B**	**2A**	**2B**
Class 4A	12	11.8	9.4	8.7
Class 3A	11.5	10.1	9.1	8.4
Class 3B	8.4	7.6	8.9	6.2
Class 3C	12.3	9.5	7.0	5.9
Combined:	10.9	9.7	8.7	7.4

In the Intrusive Word tests, the difference of mean between the scores for Test 1A and 1B is significant at the 5% level ($t = 1.96$). Hence the 'A' (chronological) version of Text 1 was easier than the 'B' version. There is no difference between the mean scores for Text 2.

In the Recall tests, the difference between the combined mean scores for Text 1 is significant at the 5% level ($t = 1.95$). Thus the 'A' version of Text 1 was significantly easier to recall than the 'B' version. The difference between the mean scores for 2A and 2B is also significant at the 5% level ($t = 2.5$). Thus in the case of Text 2, the 'A' version was again significantly easier to recall than the 'B' version.

With one exception, therefore, the scores showed that the chronolog-

/ically

ically ordered versions of the texts were significantly easier than the non-chronological ones.

4.4.5.4. Independent Scoring: A random sample of 40 recall scripts of the 2 versions of Passage 2 was marked by two independent markers, each marking 20 scripts. The correlation between marks awarded by the first independent marker and the original marker was .88 (Spearman Rank Coefficient, corrected for ties). The correlation between the second independent marker and the original marker was .94. In both cases, the mean of the 'A' scores was higher than that of the 'B' scores, and in both cases, the difference between the means was in fact greater than that shown in the original marking.

4.4.6. Additional Comments on the Recall Scripts, Sub-Experiment 1 and Re-Run: Two further points of interest emerged from the Recall scripts. The first concerns the interpretation of the time sequence of Passage 2 by those subjects recalling the 'B' version. In this version, the information that 'the party arrived in Katmandu in late August' occurs later (in order of mention) than the information that the expedition had to be abandoned and the party turned back. At least 9 subjects took the order of mention as paralleling order of occurrence, and interpreted the text as saying that the party turned back and then arrived in Katmandu. Overt signs of this interpretation are the substitution, for the 'arrived in Katmandu' of the original, of 'arrived back', 'arrived .... on the way down' and 'returned'. In no case did the 'A' version give rise to this error.

There is, admittedly, nothing in the 'B' text up to and including the sentence 'The party arrived ...etc' to rule out this interpretation.

/After

After this sentence, however, the interpretation becomes difficult to maintain, since the passage goes on to detail the initial steps of climbing the mountain, all obviously following the arrival in Katmandu. One or two subjects were content to leave the contradiction unresolved; others attempted to resolve it by interpreting the last third of the text as an account of a second attempt to climb the mountain. That is, 'the party arrived back in Katmandu, after which a second expedition set up base camp'. The fact that several other subjects, with one exception all belonging to the 'B' group, produced the 'Second Expedition' interpretation leads me to suspect that they too had interpreted 'arrived in Katmandu' as 'arrived back', even though they did not make this interpretation overt. This appears to be evidence that some subjects interpreted the text as being chronological when in fact it was not, and hence as evidence that subjects expected, and preferred chronological order. If true, this would be in line with the Clarks' findings (Clark and Clark, 1968).

The second point of interest concerns the order in which events were recalled. In general, there was a strong tendency for subjects to recall units in the order in which they occurred in the versions of the text they had read. Thus in the case of Passage 2, virtually everyone recalling the 'A' version began with Unit 1, 'The British Everest Expedition arrived in Katmandu ...' and virtually everyone recalling the 'B' version started with Unit 14, 'Extreme winds and trouble with their tents ...'. This was as expected. There was, however, a marked tendency for subjects recalling the 'B' version to move Unit 9, which described the first event but occurred in position 9 in their version,

/closer

closer to the beginning of their recalled version. This could be detected by noting the number of units subjects moved Unit 9 past, that is, the number of units which in the original 'B' text had preceded Unit 9, but which, in the recalled scripts, were made to follow it. According to this measure, 5 subjects moved Unit 9 two places upwards, relative to other units, and one subject moved it 3 places upwards. A seventh subject omitted Unit 9, but moved Unit 10 four places upwards. There was no comparable phenomenon in the recall of the 'A' texts. This suggests that certain subjects, attempting to recall the non-chronological version of the text, reorganized it to conform more to a chronological order.

4.4.7. Conclusion: If the results of Sub-Experiment 2 are ignored on the grounds that the numbers involved were too small, then the experimental results on the whole confirm the hypothesis. That is, chronologically ordered texts are both faster to read and easier to recall than non-chronological equivalents. There were two exceptions to this. In Sub-Experiment 1, the recall of Text 1A was no better than the recall of 1B. In the Re-Run of the experiment, the Intrusive Word Test detected no difference between Texts 2A and 2B.

The second exception mentioned above is perhaps easier to explain. The Pre-Experimental text of Passage 2, and hence Experimental Text 2B, consisted virtually of a chronologically ordered narrative which had been broken in two, the second section being then transposed to initial position. On the whole, the separate sections in themselves followed chronological order. That is, in the majority of cases, each clause or sentence was followed by a clause or sentence in accordance with

/chronological

chronological order.

On the other hand, the 'B' version of Passage 1 had been constructed, at least in part, by altering the order of clauses inside sentence boundaries. In this instance, it was frequently the case that clause followed clause, or sentence followed sentence, in a way that deviated from chronological order. If we assume that comprehension and thus reading speed are affected by different ordering at clause and sentence level, but not by the ordering of larger 'chunks' of text, this would explain why in the Re-Run, the Intrusive version of 1A was easier than 1B, but 2A was not easier than 2B. It would not, of course, explain why in Sub-Experiment 1, the Intrusive version of 2A was in fact significantly easier than 2B.

Why, in Sub-Experiment 1, the Recall of 1A was not significantly different from that of 1B, whereas in the Re-Run, 1A was significantly easier to recall, remains unexplained.

On the whole, the results obtained are in line with those obtained by the Clarks (1968). That is, in 3 cases out of 4, chronological texts were easier to recall than non-chronological ones. Nor do the results appear to support the distinction, drawn by both Smith and McMahon (1970) and by Bever (1970) between comprehension and memory, with chronological ordering affecting the latter but not the former If one accepts the Intrusive Word Tests as measuring some kind of comprehension, then chronological ordering affected comprehension in 3 out of 4 cases. And even in the case of the Recall Tests, the time involved, between 6 and 7 minutes in most cases, is much shorter than the lower level of 20 minutes Bever sets for middle-term recall, after

/which

which, according to him, chronological ordering should begin to have an effect.

More generally, the results appear to vindicate the rhetoricians, and to provide objective evidence that the selection of a particular form of organization will result in a text that is, in defined ways, more readable than would have been the case if another organization had been chosen.

CHAPTER 5

NATURAL PRINCIPLES

B. SPATIAL ORGANIZATION

5.1. Introduction: Along with time, spatial relationships are frequently mentioned by rhetoricians as governing the organization of certain types of paragraph. Lackstrom, Selinker and Trimble (1972) include 'space' as one of the 'natural principles' of organization 'which the technical author is virtually forced to use' (p. 8). They do not, however, give details of what type of spatial organization adherence to this principle will involve. According to Hodges and Whitten, 'Sentences that have no evident time order can sometimes be arranged in 'space' order, in which the paragraph moves from east to west, from west to east, from the near to the distant, from the distant to the near, from the left to the right, etc. This order is used especially for descriptive paragraphs.' (Hodges and Whitten, 1962: p. 329) McCrimmon, writing like Hodges and Whitten to advise American college students, makes similar claims, and is quoted at length below:

> 'A space order is useful when the writer wishes to report what he sees. The movement of the paragraph thus follows the movement of his eyes. That movement must have some continuity which a reader can recognize and follow. It need not start at the far left and move steadily to the far right, or vice versa, since in any view an observer's gaze is likely to be drawn quickly to the most conspicuous object. But there should be

/some

some logical or natural progression from one descriptive detail to the next. It may be very confusing to flit hazardly from left to right, to center, then to left again.' (McCrimmon, 1963: p. 77).

This account shares with Hodges and Whitten the view that spatial organization is particularly suitable for descriptive paragraphs. The two accounts are also similar in suggesting several possible 'directions' of ordering, none of which seems to be intrinsically superior to another. This is different from the rhetoricians' views on time ordering, where it was suggested that one type of organization was superior.

To be fair to McCrimmon, it must be kept in mind that he is giving advice on how to write a descriptive text of a rather literary kind. Nevertheless, the following general criticisms can be made against his account:

1. He appears to lay too much stress on the role of descriptive writing in evoking concrete visual imagery. Readers may vary greatly in the amount of use they make of such imagery.

2. He confuses writer and observer, although in certain kinds of writing, novels, for example, the two may not be identical.

3. He argues, rather oddly, that the movement of the paragraph follows the movement of the writer's eyes, but that the latter movement is constrained by the requirements of paragraph readability.

If we make allowance for the defects of McCrimmon's account, we can gather from it at least three reasons for adopting a space order:

1. To enable the reader to follow directly the visual experiences of the observer. However, most descriptions in factual text-books are of an

/objective

objective nature, so that the importance of the observer becomes minimal.

2. To allow the writer to thematize. McCrimmon sees this in terms of visually conspicuous objects, but this is not the only reason for thematizing a particular part. On the whole, since the Recall test used in this experiment was intended to test subjects' ability to recall the whole of a text, each unit was treated as being of equal importance, and thematization was not taken into account.

3. To allow the reader to process the information more easily, by providing 'some continuity which a reader can recognize and follow'. McCrimmon seems to suggest that a text may be more difficult ('confusing') if the reader cannot recognize the ordering principle being applied. A difference between Time Organization and Space Organization is that in the former case, the rhetoricians suggested that one particular order was superior. In the second case, the suggestion is that there exist a large number of valid orderings. It is possible, however, that certain spatial organizations are more commonly selected, and hence more easily recognized, than others. Hodges and Whitten, for example, mention paragraph movement 'from east to west, from west to east, from the near to the distant, from the distant to the near' etc. What all these have in common is that they appear to involve starting at one 'end', and progressing in the same direction all the time to the other 'end'. It may be that for descriptions of certain objects, scenes etc. this is the most common and most easily recognised principle of organization.

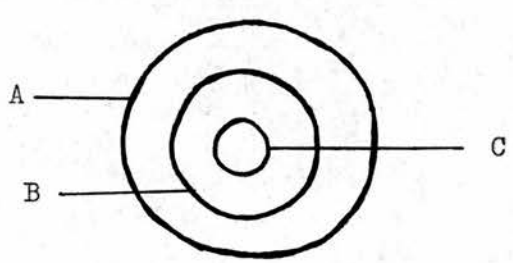
Faced with such a recognizable ordering, the reader might enjoy one of two advantages. Firstly, if he was already at least partly familiar with the objects, etc. being described, then once he had recognized the

/ordering

ordering being used, he could presumably predict the appearance of each utterance. This might result in a faster reading speed. Secondly, even if what was being described was unfamiliar, if the reader's preference for a particular order was very strong, then if a text diverged from this order of organization, the reader might have to spend time re-ordering it to conform to his preferred order. This is what some psycholinguists have suggested happens when the reader encounters the 'second event first' order in temporal sequences. This processing would take time, and would therefore slow reading speed. Given the large number of possible orderings, with none having any obvious advantage over the others, this seems on the whole to be unlikely. It may be, however, that the use of a recognizable ordering principle facilitates recall.

5.2. Hypothesis: The basic hypothesis was that a uni-directional linear order of description would result in a text more readable than a corresponding text in which the organization of the items deviated from such an order. Both Primary Passages selected for the experiment were descriptions of approximately spherical objects, containing various interior sections which could be described in linear sequence either by starting from the exterior and working inwards, or vice versa. In fact, the 'outside to inside' direction was chosen on both occasions, for reasons that will be stated later. Thus in particular, the hypothesis stated that, given such an object as is shown in Figure 1 below,

Fig. 1



/and

and a string of structures 'a', 'b' and 'c', each of which describes one of the parts of the object, then a more readable text will result if the structures are ordered in a text as 'a' + 'b' + 'c', rather than, for example, 'b + a + c'.

There was a certain amount of evidence that appeared to give initial support to the hypothesis that an ordering of elements in an 'Outside to Inside' direction represented a 'normal' organization which might be expected to facilitate reading.

(i) It appeared to be the ordering principle selected by the author of Primary Passage 1 (cf. p.120). No clear ordering principle could be detected in Primary Passage 2.

(ii) A group of research scientists, given the units of Experimental Passage 1 in a jumbled form and asked to arrange them in a more intelligible way chose on the whole an 'Outside to Inside' ordering (cf. p.121).

(iii) A small group of adults, and a larger group of children, when asked to study the diagram accompanying Primary Passage 2 and then to draw it from memory, almost all drew it starting from the outside and working inwards. It may be, of course, that this represented a specialized drawing strategy.

5.3. 1st Experiment.

5.3.1. Primary Passages: The first text chosen was a description of the plant cell 'Chlamydomonas', the second of a generalized reptile egg. The two were selected for the following reasons:

1. Both were factual passages of the sort that school pupils might be expected to study.

/2.

2. Both consisted of, or at least contained, descriptions of the physical appearance of moderately complex objects, for which a spatial organization would seem to be appropriate.

3. The objects described are fairly similar, consisting of a roughly spherical external covering containing various structures. This similarity made it possible to hypothesize that the same spatial organization, a unidirectional ordering from outside to inside, would be most suitable for both passages.

4. In their original form, both passages were accompanied by diagrams of a simple, two-dimensional nature. This was useful for three reasons: firstly, it simplified the task of analysing the spatial order selected by the writers of the original texts. Secondly, the presence of these diagrams seemed to imply that the writers thought the relative position of each part of the object they were describing was important for the reader. Thirdly, the diagrams were used in the first version of the experiment, for reasons that will be described later.

5.3.2. Construction of Experimental Texts:

5.3.2.1. Passage 1: 'Chlamydomonas': The Primary Passage was taken from 'Seaweeds and other algae' by C. L. Duddington, Faber and Faber, 1966, pages 32 and 33, paragraphs 2 and 3.

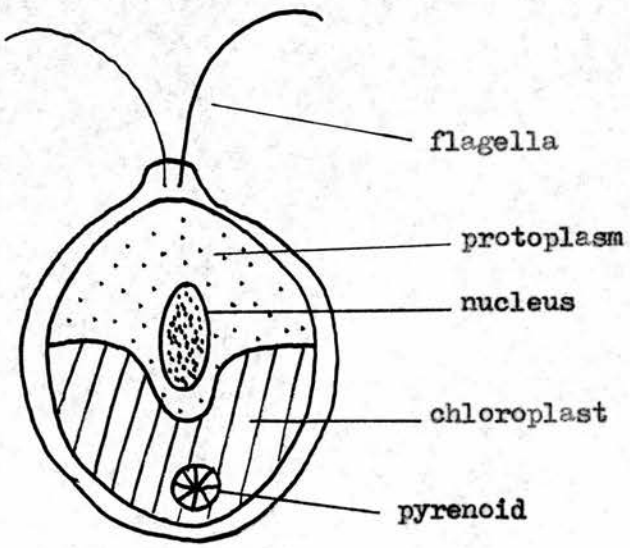
The Pre-Experimental Passage was produced by shortening the first paragraph, mainly by omitting a sentence describing the movements of the flagella, and by removing the paragraph division (in the Primary Passage, the second paragraph began at 'The most conspicuous object ...'). The Pre-Experimental Text, along with the diagram taken from p. 33 of the book, is given below. Sentences are numbered for reference purposes:

/Pre-Experimental

Pre-Experimental Passage 1:

1. Chlamydomonas consists of only a single cell, but in that cell is contained all the essential attributes of a complete plant. 2. It is usually egg-shaped, one end being somewhat pointed. 3. From the pointed end sprout two very fine protoplasmic 'tails' which by their waving movements enable the tiny organism to swim actively in the water in which it lives. 4. They are called flagella, from the Latin word 'flagellum', meaning a whip. 5. The most conspicuous object in the Chlamydomonas cell is a large green chloroplast. 6. The form of this varies from species to species, but it is usually cup-shaped, and it is situated at the hinder end of the cell, of which it occupies more than half. 7. The remainder of the cell is occupied by the living protoplasm, and this contains a nucleus, which is usually partly hidden in the cup formed by the chloroplast. 8. On one side of the chloroplast there is usually a pyrenoid, similar to those found in Spyrogyra. 9. Some species of Chlamydomonas have more than one pyrenoid, and may even have more than one chloroplast.

Fig. 2



Chlamydomonas

/It

It can be easily seen that the greater part of this text is taken up with straightforward physical description of the plant cell. The only exceptions to this are the writer's description of the function of the flagellae (S.3) and the account of the derivation of the name (S.4), together with the opening sentence, which functions to orientate the reader.

5.3.2.1.1. Decomposition into Units: This was carried out in the same general manner as in Experiment 1 (cf. 4.4.1.3.). In this case, those sections of the text which were considered relevant and formed the basis of the units were those which (a) referred to one of the parts of the object being described (ie. the egg) and also (b) described either the appearance of the part or its position relative to the other parts.

A relevant section which appeared in the text as a syntactically independent sentence was taken unchanged as a unit. Relevant embedded structures were replaced as units by independent sentences derived from the same underlying strings as the embedded structures. Noun phrases which had been replaced in the text by pronouns were generally restored. Thus the sentence,

'It is usually egg-shaped, one end being somewhat pointed'

yielded two units,

(a) The cell is usually egg-shaped.

(b) One end of the cell is somewhat pointed.

Embedded structures which did not refer to either the position or appearance of one of the parts of the object were left unaltered, and did not form separate units. Independent sentences of the text which contained no

/reference

reference to either the position or appearance of a part were left unaltered, and for convenience were assigned a unit number.

If an embedded sentence contained the same information as a previously decomposed unit, then it was not itself decomposed. For example, in the sentence,

'The nucleus is usually partly hidden in the cup formed by the chloroplast'

the embedded sentence, 'the cup (is) formed by the chloroplast' has not been decomposed, since this information is already given by the previously decomposed unit,

'The chloroplast is usually cup-shaped'.

For the purposes of analysis, it was probably unnecessary to decompose Adj. + Noun structures into Noun + be + Adj. structures, since in the reconstructed passage, it was likely that the adjectives would appear again used attributively. It was, however, done, partly for consistency, partly with the marking scheme of the Recall tests in mind.

5.3.2.1.2. Units: The units into which the passage was decomposed were as follows:

1. Chlamydomonas consists of only a single cell but in that cell is contained all the essential attributes of a complete plant.
2. The cell is usually egg-shaped.
3. One end of the cell is somewhat pointed.
4. From the pointed end of the cell sprout two protoplasmic tails.
5. The tails are very fine.
6. By their waving movements the tails enable the tiny organism to

/swim

swim in the water in which it lives.

7. The tails are called flagella, from the Latin word 'flagellum', meaning a whip.
8. The most conspicuous object in the Chlamydomonas cell is a chloroplast.
9. The chloroplast is large.
10. The chloroplast is green.
11. The form of the chloroplast varies from species to species.
12. The chloroplast is usually cup-shaped.
13. The chloroplast is situated at the hinder end of the cell.
14. The chloroplast occupies more than half the cell.
15. The remainder of the cell is occupied by the protoplasm.
16. The protoplasm is living.
17. The protoplasm contains a nucleus.
18. The nucleus is usually partly hidden in the cup formed by the chloroplast.
19. On one side of the chloroplast there is usually a pyrenoid.
20. The pyrenoid is similar to those found in Spyrogra.
21.. Some species of Chlamydomonas have more than one pyrenoid, and may even have more than one chloroplast.

5.3.2.1.3. Spatial Ordering of Pre-Experimental Passage 1: The numbering of the units above corresponds in general to the order of appearance in the passage of the structures from which the units derive. It can thus be seen that the spatial ordering chosen by the writer is as follows:

1. Exterior shell (1,2,3)
2. Tails/Flagella (4,5,6,7)

/3.

3. Chloroplast (8,9,10,11,12,13,14)
4. Protoplasm (15,16,17)
5. Nucleus (17,18)
6. Pyrenoid (19,20,21)

If we compare this ordering with Figure 2 on p. 116, we may draw the following conclusions about the ordering principles the writer has selected:

(i) With the exception of the flagella, the parts are described in the order 'Outside to Inside'. Both Chloroplast and Protoplasm are inside the Exterior Shell and are described after it. The Nucleus, which is described in the text as being inside the Protoplasm, is described immediately after that part. From the diagram it appears that the Pyrenoid is inside the Chloroplast. However the text makes clear that it is on the side of the Chloroplast.

(ii) There also appears to be an element of another ordering principle, that of 'Bigger to Smaller'. Thus while both Chloroplast and Protoplasm are inside the Shell, the Chloroplast is bigger, and is described first. The Pyrenoid, which according to the diagram is the smallest part, is described last.

(iii) We might summarize the principles that appear to have been used here as 'Outside to Inside' and when this leaves a choice, then 'Bigger first'.

As an informal test of whether this represented a 'normal' ordering

/principle

principle for the description of such objects, a group of research scientists were given the base sentences of the decomposed Chlamydomonas text in jumbled order, together with the diagram, and asked to rearrange the base sentences to form a more coherent description of the object. The majority agreed with the initial order of

1. Shell 2. Flagella 3. Chloroplast

At this point, there was a divergence, one group proceeding with

4. Protoplasm 5. Pyrenoid 6. Nucleus,

the other group choosing

4. Pyrenoid 5. Protoplasm 6. Nucleus.

Thus it looks as if both main groups were adhering to the principles described above, the difference being that the first group attached more importance to the 'Bigger first' principle, and thus described the Protoplasm before proceeding to the two smaller objects. The other group adhered rather more strictly to the 'Outside to Inside' principle, and described what they took to be inside the Chloroplast before proceeding to the Protoplasm and then to what was inside it in its turn.

The measure of agreement between both groups and the writer of the Primary Passage was high enough to allow one to consider the spatial ordering selected by the writer, that is, starting at the exterior and moving progressively inwards, as constituting a 'normal' order for the description of such an object. One would therefore hypothesize that this ordering is likely to facilitate reading of the text. In consequence, Pre-Experimental Passage 1 was taken, without alteration, to form Experimental Passage 1A (linear).

/5.3.2.1.4.

5.3.2.1.4. Construction of Experimental Passage 1B (non-linear): This involved producing a text in which the ordering of the parts deviated from the 'Outside to Inside' order of Experimental Passage 1A. The order selected, more or less randomly, was as follows:

1. Nucleus 2. Protoplasm 3. Chloroplast 4. Pyrenoid
5. Exterior 6. Flagella.

To produce this new order, the units were arranged as follows:

1, 17, 16, 15, 14, 18, 9, 10, 13, 8, 11, 13, 19, 20, 21,
2, 3, 4, 5, 6, 7.

The units were then combined to form Experimental Passage 1B by normal processes of embedding, pronominalization, etc. A certain amount of difficulty in the writing of this text was caused by the fact that in the changed ordering, the units relating to the Protoplasm precede those relating to the Chloroplast. Thus it was not possible, for example, to make use of the unit,

'The remainder of the cell is occupied by the protoplasm.'

as it stood. The difficulty occurred mainly with those units which referred to the relative proportions of the cell occupied by Chloroplast and Protoplasm, and was solved by replacing such sentences with their 'converse' forms. Thus the unit,

'The chloroplast occupies more than half the cell.'

was replaced by the 'converse' sentence,

'The protoplasm occupies less than half the cell.' etc.

Experimental Passage 1B appears below:

/Passage 1B

Passage 1B

Chlamydomonas consists of only a single cell, but in that cell is contained all the essential attributes of a complete plant. First there is the nucleus, surrounded by the living protoplasm, which is situated in the topmost end of the cell, of which it occupies rather less than half. The nucleus is usually partly hidden in the cup formed by the large green chloroplast occupying the remainder of the cell. The chloroplast, which is the most conspicuous object in the Chlamydomonas cell varies in form from species to species, but it is usually cup-shaped. On one side of the chloroplast there is usually a pyrenoid, similar to those found in Spyrogyra. Some species of Chlamydomonas have more than one pyrenoid, and may even have more than one chloroplast. The cell itself is usually egg-shaped, one end being somewhat pointed. From the pointed end sprout two very fine protoplasmic tails, which by their waving movements enable the tiny organism to swim actively in the water in which it lives. They are called flagella, from the Latin word flagellum, meaning a whip.

5.3.2.1.5. Texts 1A and 1B Compared: Both 1A and 1B consist of 9 sentences. Text 1A contains 178 words, 1B 180 words. The Fog Index of 1A is 14, of 1B 15.

Because the production of the B Text required a fair number of syntactic changes, a check was made on the relative syntactic complexity of each version. This was done by counting the number of clauses and V + ing phrases. The 'A' version contains 22, the 'B' version 23. The maximum number of clauses in any one sentence in either text is 4. Sentences 1,3,

/4,

4, 8 and 9 of the 'A' text are identical to sentences 1, 8, 9, 5 and 6 respectively of the 'B' text.

5.3.2.2. Passage 2.1 'The Reptile Egg': The Primary Passage was taken from 'Man and the Vertebrates' by A. S. Romer (Penguin Books, 1954), Volume 1, Chapter 5, p. 80, and the accompanying diagram from p. 81.

As it stood, the Primary Passage was more of a description of the functions of the different parts contained by the egg, rather than of their position and appearance. This was undesirable since the organization of such a text might be expected to differ from that of a purely descriptive text. The diagram of the egg, however, was accompanied by a caption which represented much more closely a description of the physical appearance of the egg and its contents. The caption was too technical in itself to be used for experimental purposes. However, parts of it were used to supplement the physical description given in the Primary Passage, and to replace some of the functional description. This composite text was then shortened and simplified, and prefaced by an opening sentence taken from a preceding paragraph of the same chapter. The Pre-Experimental Passage which resulted from this is given below:

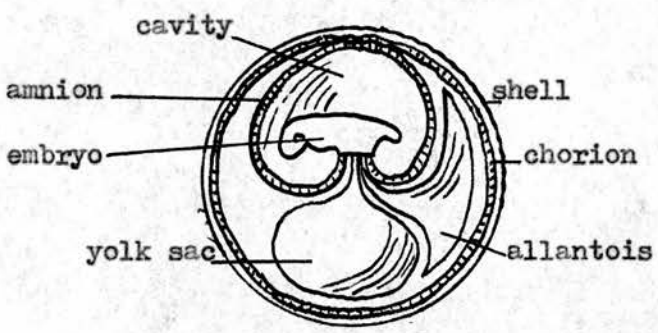
Pre-Experimental Passage 2:

> The reptilean egg has a complicated structure to which we must devote some attention. As a food supply for the embryo, the egg contains a large amount of nourishing yellow yolk, which is contained in a sac connected with the digestive tract. A membrane called the amnion, which is attached to the skin of the embryo, encloses a large, liquid-filled cavity which develops about the body of the embryo. It provides protection against injury and

/the

the danger of becoming too dry. Developing from this, and connected to it is a second membrane, called the chorion, which lies beneath the shell. Out from the back end of the embryo's body there grows a tube and sac, the allantois, in which the waste matter of the body is deposited. The whole egg structure is stiffened and protected by a firm shell on the exterior. The shell, however, is porous. Blood vessels surrounding the allantois carry to the embryo oxygen which has passed in through the porous shell of the egg, so that the allantois acts as a lung.

Fig. 3.



5.3.2.2.1. Decomposition into Units: The procedure was the same as described for Pre-Experimental Passage 1. Only those structures that referred to the position or appearance of the parts of the object were regarded as relevant and decomposed to form units.

The units were as follows:

1. The reptilean egg has a complicated structure to which we must devote some attention.
2. As a food supply for the embryo, the egg contains a large ammount of yolk.

/3.

3. The yolk is nourishing.
4. The yolk is yellow.
5. The yolk is contained in a sac.
6. The sac is connected with the digestive tract.
7. A membrane called the amnion encloses a cavity.
8. The cavity is large.
9. The cavity is filled with liquid.
10. The amnion is attached to the skin of the embryo.
11. The cavity develops about the body of the embryo.
12. The amnion (cavity?) provides protection against injury.
13. The amnion (cavity?) provides protection against the danger of becoming too dry.
14. The chorion develops from the amnion.
15. The chorion is connected to the amnion.
16. A second membrane called the chorion lies beneath the shell.
17. A tube and sac, the allantois, grows out from the back end of the embryo's body.
18. The waste matter of the body is deposited in the allantois.
19. The whole egg structure is stiffened by a firm shell on the exterior.
20. The shell is porous.
21. Blood vessels surround the allantois.
22. The blood vessels carry oxygen to the embryo.
23. The oxygen has passed in through the porous shell of the egg.
24. The allantois acts as a lung.

/5.3.2.2.2.

5.3.2.2.2. Spatial Ordering of Pre-Experimental Passage 2: The units above are numbered to correspond to the order of appearance in the text of the structures from which the units are derived. It can thus be seen that the ordering selected by the writer of the Primary Passage is as follows:

1. Yolk/Yolk Sac (Units 2, 3, 4, 5, 6)
2. Amnion/Amnion Cavity (7, 8, 9, 10, 11, 12, 13)
3. Embryo (10, 11)
4. Chorion (14, 15, 16)
5. Allantois (17, 18, 22, 24)
6. Shell (19, 20)

(The blood vessels referred to by Units 21 and 22 are not shown in the diagram and so are not included in the scheme above).

Referring to Figure 3 on p. 125, it seems reasonable to suggest that adherence to the ordering principle 'Outside to Inside' would have resulted in the following order of mention:

1. Shell 2. Chorion 3. Amnion/Amnion Cavity 4. Embryo
5. & 6. Yolk Sac and Allantois.

(It is probably necessary to appeal to a third ordering principle, something like 'Main body before Attachments', to explain the position in which the Allantois and Yolk Sac are placed here with respect to the Embryo).

As an informal test of whether the above re-ordering represented a 'normal' order, a small group of adults were asked to study the diagram of the egg and draw it from memory. All drew it in the order,

/1. Shell

1. Shell 2. Chorion 3. Amnion 4. Embryo 5/6. Yolk/Allantois. (One person reversed the relative order of the last two).

In the course of the experiment, one class of students, who had been asked to do the same thing, claimed with one exception to have chosen the same order as the adults. It may be, of course, that drawing calls for quite separate strategies from those of reading.

If the above re-ordering is considered 'normal', then the organization of Pre-Experimental Passage 2 deviates considerably from the 'normal' order. The Pre-Experimental Passage was thus taken unchanged as Experimental Passage 2B (non-linear).

5.3.2.2.3. Construction of Experimental Passage 2A (linear): In order to correspond to the 'normal' ordering, the units were rearranged as follows:

1, 19, 20, 16, 14, 15, 10, 7, 8, 9, 11, 12, 13, 2, 3, 4, 5, 6, 17, 18, 21, 22, 23, 24.

Then, by processes of embedding and pronominalization, the following Experimental Passage (2A) was produced:

Passage 2A

The reptilean egg has a complicated structure to which we must devote some attention. On the exterior the whole egg structure is stiffened and protected by a firm shell. Lying beneath the shell is a membrane called the chorion, which has developed from, and is connected to a second membrane called the amnion. The amnion, which is attached to the skin of the embryo, encloses a large, liquid-filled cavity which develops about the body of the embryo. It provides protection against injury and the danger of becoming

/too

too dry. As a food supply for the embryo, the egg contains a large amount of nourishing yellow yolk, which, as the embryo grows, is contained in a sac connected with the digestive tract. Out from the back end of the embryo's body there grows a tube and sac, the allantois, in which the waste matter of the body is deposited. The shell is porous. Blood vessels surrounding the allantois carry to the embryo oxygen which has passed in through the porous shell, so that the allantois acts as a lung.

5.3.2.2.4. Texts 2A and 2B Compared: Both 2A and 2B contain 9 sentences. There are 178 words in 2A, and 177 words in 2B. The Fog Index for both texts is 14. Sentences 1, 2, 5, 7, 8 and 9 of 2A are identical, or virtually identical, to sentences 1, 7, 4, 6, 8 and 9 of 2B.

5.3.3. Subjects: The tests were carried out in March 1973 with 51 students from classes 3 '0'1 and 3 '0'2 at Portobello High School. Twenty-six subjects did the 'B' tests and 25 the 'A' tests. The groups were formed by dividing each class into two on a random basis.

5.3.4. Procedure: The Intrusive Word Test was used. Into both pairs of texts 22 intrusive words were inserted, at random intervals determined by permutations of 16. The tests are given in Appendix 1.

Subjects were first given the diagram of the Chlamydomonas cell and asked to study it and then draw it from memory. They then had the Intrusive Word Test explained to them and discussed an example. They themselves timed their reading speed. After this, the procedure was repeated for the 'Reptile Egg' diagram and text.

The students were asked to draw the diagram for a variety of reasons.

/Firstly,

Firstly, it was hoped that in so doing they would become at least partly familiar with the technical vocabulary. It was thought that when an Intrusive Word test was used, the presence of quite unfamiliar words might put the students at an unfair disadvantage. Secondly, studying the diagram and then drawing it might be expected to familiarize the students with the actual object, at least, with its physical appearance. It has already been suggested here that if a reader is partly familiar with the object being described, then a recognition of the ordering of the text will enable him to predict, with possibly a faster reading speed in consequence.

A third reason was that it was hoped that this procedure would induce the students to think in terms of physical relationships when approaching the written description. It had been noticed in informal pre-tests with adult subjects that if they were asked to read the text, and after they had read it, asked to draw the object whose description they had just read, they were almost totally incapable of doing so. This suggests that unless one is given a set towards learning spatial relationships, then these will be ignored. If this happened, then it is likely that any spatial ordering of the text would be irrelevant. However, if one had been given a set towards learning spatial relationships, then an easily recognizable spatial ordering might be helpful to the reader when he attempted to process the information in the text.

A major difference between procedures used in this and in the previous experiment was that students were allowed to finish reading the text, and measured the time they took to do so. This was done by the relatively familiar technique of the experimenter pointing out the time marked out

/in

in intervals of 5 seconds on the blackboard. Subjects on completing the text noted down the time they had taken.

5.3.5. Results: For each passage there were two scores, first the **time** taken by subjects to read the passage, secondly subjects' score on the Intrusive Word Test. For Passage 1 (A and B) this was out of 22, for Passage 2 out of 20.

Scores are summarized in Table 4 below. Figures given are means. Actual scores are presented in Appendix 2. Time scores are given in seconds.

Table 4

		Time	Intrusive Word Score
Passage 1	A	161.4	16.3
	B	179.2	17.5
Passage 2	A	167.5	16.4
	B	158.4	18.2

None of the differences attains statistical significance.

5.3.6. Discussion: If the hypothesis was valid, then one of the following combinations of results should have occurred.

(i) 'A' group subjects should have scored higher on the Intrusive Word Test AND read the texts more quickly than the 'B' group.

(ii) 'A' group should have scored higher and read the texts at the

/same

same speed as the 'B' group.

(iii) 'A' group should have scored the same as 'B' group but read the texts more quickly.

None of these combinations were in fact obtained.

One conclusion might be that the rhetoricians were wrong and that spatial ordering is irrelevant for all practical purposes. This however seems too sweeping. Another possible explanation is that the reader will only process details of spatial organization if he is driven to do so. The drive might be personal, or, as is more likely in an experiment, produced by the task set. In the experiment just described, the part that forced the subjects to concentrate on the spatial organization of the parts of the object was the drawing recall task, and this was completed before the subjects read the text. When they came to the Intrusive Test, they were under no compulsion to process the spatial relationships described. It may be that relieved of this necessity, they could operate at a fairly simple syntactic level.

Bransford and Johnson (1972) found that subjects' comprehension of a text was higher if they were shown the 'story' in picture form before reading the text. The difference between their results and the present results may lie in the different texts used, a narrative text in the first case, a descriptive one in the second. Language is in general not a particularly efficient tool for descriptions. Pictures are often much more efficient. Language is, on the other hand, a very efficient tool for narration. It may be, partially as a consequence of this, that language users, when confronted with a narrative, are motivated to understand it 'fully', whereas, faced with a descriptive text, they are

/content

content to gain a general impression of what it is about. The subjects in the Bransford and Johnson experiment may have been able to comprehend the text fully with the aid of the pictures, whereas in the present experiment the diagrams may have been irrelevant since the subjects read the text at some superficial level.

It may be, then, that the Intrusive Word Test can be successfully performed at a relatively superficial level of comprehension. Paragraph organization may only affect reading efficiency when the reader proceeds beyond this level.

It thus became necessary to repeat the experiment using additional test forms, which it was hoped would force the subjects to operate on a different, deeper level of comprehension.

5.4. Experiment 2: In view of the unsatisfactory results obtained in the previous experiment, it was decided to repeat the experiment, making some changes. These were as follows:

1. It was decided that the order of mention selected for the non-normal version of Passage 1, namely,

Nucleus, Protoplasm, Chloroplast, Pyrenoid, Exterior, Flagella.

was, in fact, rather too close to the 'normal' order, only reversed. The rank correlation between the two orders is -.6. The order was therefore changed to follow the sequence

CELL, PYRENOID, CHLOROPLAST, NUCLEUS, PROTOPLASM, FLAGELLA,

and Experimental Passage 1B was re-written to conform to this order of mention. The resulting Experimental Passage was as follows:

/Text

Text 1B (second version).

Chlamydomonas consists of only a single cell but in that cell is contained all the essential attributes of a complete plant. It is usually egg-shaped, one end being somewhat pointed. There is usually a pyrenoid, similar to those found in Spyrogyra. It is situated on one side of a large green chloroplast. This is the most conspicuous object in the Chlamydomonas cell, and varies in form from species to species, but it is usually cup-shaped. It is situated at the hinder end of the cell, of which it occupies more than half. Some species of Chlamydomonas have more than one pyrenoid, and may even have more than one chloroplast. Usually the cup formed by the chloroplast partly hides the nucleus, which is contained in the living protoplasm that occupies the remainder of the cell. From the pointed end of the cell sprout two very fine protoplasmic 'tails' which by their waving movements enable the tiny organism to swim actively in the water in which it lives. They are called flagella, from the Latin word 'flagellum' meaning a whip.

2. The number of intruded words was increased from 20 and 22 to 35, the latter number being inserted according to random permutations of 9.

3. The drawing task was omitted, and a test of Free Recall was used along with the Intrusive Word test.

4. Subjects were allowed a fixed time in which to do the Intrusive Word Test, rather than being allowed to finish and timing themselves.

5.4.1. Subjects: The tests were administered to 57 pupils of Classes 3 A'1'

/and

and 3A '2' of Inverness Royal Academy, in April, 1973. Subjects were divided randomly into two groups, one group doing the 'A' texts, the other the 'B' texts.

5.4.2. Procedure: Subjects were given an example of the Intrusive Word Test in operation. They were then allowed 2¼ minutes for Passage 1 (Intrusive Word Test). The procedure was then repeated for Passage 2, the same time being allowed.

For the Recall questions, it was explained to the subjects that they would be given a limited amount of time to read the passages, then would be asked to write down as much as they could remember of the passage, without referring back to the text. They were told that they could use their own words if they wished, and that they would not lose marks for misspellings, errors in grammar, punctuation etc.

For each passage, they were allowed 1 minute of Reading Time, and 7-9 minutes of Writing Time.

5.4.3. Results: Mean scores for the groups doing the A and B texts are given in the Table below:

Table 5

Intrusive Word test:	Passage 1	Passage 2
A	19.6	25.0
B	19.6	24.7
Recall Test		
A	10.3	8
B	8.4	5.6

/No

No significant differences between mean scores were detected by the Intrusive Word Tests. However, differences between the Recall scores for the 'A' and 'B' texts were significant in both cases at the 5% level. In fact, both 1A and 2A were easier to recall than 1B and 2B respectively, at the 1% significance level.

5.4.4. Conclusion: It appears, therefore, that a linear form of organization makes texts of this type easier to remember. The results appear to support the suggestion made during the discussion of the first run of the experiment. That is, at the level of comprehension tested by the Intrusive Word Test, spatial organization of the text does not play a significant role. Presumably, however, efficient recall requires a productive grasp of the spatial relationships described in the text, and in this case, a text organized according to linear ordering of elements, by making these relationships easier to grasp, makes for easier recall than an equivalent text organized on a non-linear basis.

In general, the results of the re-run of the experiment support the approach taken by the rhetoricians mentioned earlier, and provide further evidence that the readability of a text can be affected by its overall structural organization.

CHAPTER 6

LOGICAL PRINCIPLES OF ORGANIZATION: RELATIONSHIPS BETWEEN SENTENCES

6.1. Introduction: The ordering principles appealed to in the previous two experiments, those of Time and Space, can be considered as at least partially independent of the speech situation. That is, we generally regard the sequence of events in Time, and the position of objects in Space, as being extra-linguistic. In the next two experiments, the inter-sentence relationships used, those of Statement-Explanation, and Assertion-Substantiation/Concession/Exemplification, are more purely rhetorical. That is, they are conditioned by factors inside the speech situation, and are dependent upon the Speaker/Writer's beliefs, and his knowledge or assumptions of what the Listener/Reader knows or does not know. The distinction made here has been neatly described by Lackstrom, Selinker and Trimble (1972) as being between 'Natural Principles' of organization, which in their case are Time order, Space order, and (sometimes) Causality, and 'Logical' principles, in their case Comparison and Contrast, Analogy, Exemplification and (sometimes) Causality. According to them, 'Natural Principles' are 'those writing techniques which the technical author is virtually forced to use by the nature of his material', whereas 'Logical Principles' are 'those writing techniques which the technical author deliberately chooses to impose on his material in order that the reader will see how he, the author, visualizes the rhetorical relationships of the material at this level' (p. 8).

This chapter consists of an account of certain rhetorical relationships between sentences. It thus serves as an introduction to Chapters

/7 and

7 and 8, in which are described experiments designed to test the effect of the presence of these relationships upon reading comprehension.

6.2. The Relationships: The inter-sentence relationships discussed here, and used in the following experiments (Chpts 7 and 8), are as follows:

A. Statement - Explanation
B. Assertion - Substantiation
C. Assertion - Concession
D. Assertion - Exemplification

(The distinction made here between 'Statement' and 'Assertion' is discussed below. Basically, a statement utterance is one which the writer assumes will be accepted at its face-value; an assertion is an utterance which he assumes the reader will not accept without some further information).

6.2.1. Statement - Explanation: This is the relationship holding between the two sentences in each of the following pairs:

1. My watch has stopped. I wore it in the bath.
2. The teacher was appalled. The three representatives were all of them white.
3. The car stopped. The brakes had jammed.

In each of these pairs, an event, or state of affairs described in the first utterance, is explained by reference to an event or state of affairs described in the second utterance. Each of the above examples can be paraphrased in a variety of ways, eg.

/1a.

1a. My watch has stopped because I wore it in the bath. ('since' is normally possible but would be ambiguous here)

1b. My watch has stopped. This is because I wore it in the bath.

1c. My watch has stopped. The reason for this is that I wore it in the bath.

1d. My watch has stopped. This is caused by/due to the fact that I wore it in the bath.

1e. I wore my watch in the bath so/and it has stopped.

'Explanations' have been discussed in detail by Dakin (1969). For Dakin, an Explanation consists of two statements, in which an event described in one statement is explained by reference either to a prior event, or to a concurrent state of affairs described in the other. His method of analysis is to establish 'standard forms' for different kinds of Explanations, and then to relate differences in surface structure, particularly the use of different modal verbs, to permutations in the standard forms. Thus the sentence,

'John stopped because his brakes jammed'

and the modal usage,

'John had to stop'

are related to a standard form,

'I state S_1

I state S_1 caused S_2' [1.]

while the sentence,

/'John

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1. Dakin fails to mention the importance of the 'choice' aspect in many uses of 'have to'. In the sentence, 'John had to stop' the meaning is that John did not have a choice of action which, as an animate being, he is often capable of exercising. But in the sentence, 'The machine stopped because a gear had slipped', which is clearly a causal explanation in Dakin's terms, the subject is inanimate, and the 'choice' aspect does not appear. Hence a paraphrase with 'have to' is unlikely,

*'The machine had to stop because a gear had slipped'.

'John didn't stop because his brakes had failed' [1].

and the corresponding modal statement,

'John couldn't stop'

are related to the standard form,

'I deny S_2

I state S_1 prevented S_2'.

Dakin distinguishes 'Causes', in which the Explanation is accomplished by reference to a prior event, and the relationship between the two events is mechanistic, and 'Demands' which he considers refer to 'concurrent states of affairs'[2], and which, being at least partly determined by social rules, can be denied. Thus we can have,

'John should have stopped because the traffic lights were red'

and,

'John should have stopped but he didn't'

but not,

*'John had to stop but he didn't'.

Dakin also mentions, without discussing, sentences like,

'John laughed because the lecturer told a joke'

in which the relationship between stimulus and response is hardly mechanistic, and,

'I concluded that John was the murderer because he was the

/only

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1. Dakin seems not to have noticed the ambiguity of this sentence.
2. This seems unnecessary for his analysis. In the sentence,

'I stopped because the policeman told me to'

the explanation refers to a prior event, but in Dakin's terms, the explanation is still quite clearly a Demand rather than a Cause.

only one who had the means, motive and opportunity'

which he considers to be an Explanation in terms of inductive inference.

Since the purpose here is to provide a rough classification of inter-sentence relationships, rather than to examine the constituents of sentences, all the sub-types discussed by Dakin will be put together into the class of 'Statement - Explanation'.[1] This relationship can thus be defined as the conjunction of two statements, in which an event or state of affairs described in one statement, and accepted by the Listener/Reader as true, is then explained by reference to a prior event, or to a state of affairs either prior or concurrent, described in the other statement.

6.2.2. Assertion - Substantiation: This is the relationship holding between the sentences or clauses in the following examples:

1. This was a big task. Engineers, sanitory inspectors, dustmen and sewermen, as well as doctors, had to be recruited, trained and paid.

2. They are much like insects. The digestive tract is a straight, simple tube. The excretory system consists of tubules opening into the hind portion of the gut.

3. The judge misdirected the jury in regard to the police evidence in that he referred the jury to the replies only in the context of whether they had been elicited fairly.

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1. Bormuth and his associates, in their outline of inter-sentence relationships, distinguish between 'Causal' relationships, eg.

'The machine stopped. The gear had slipped off'

and 'Explanatory' ones, eg.

'Joe quit the team. He didn't get to play enough'

(Bormuth, Carr, Manning & Pearson, 1970)

Since, at first sight at least, English does not seem to distinguish between these two types, they will both be classified here as 'Statement - Explanation'.

4. The bus service is hopeless, hopeless. And I'll tell you why. Five buses left here for Snowdon Road last night while we were waiting in a queue.

5. Clichés are like cops, in that you can never find one when you want one.

Informally, the difference between Statement - Explanation and Assertion - Substantiation is that in the first, an explanation is offered for the event or state of affairs described in the Statement; in the second, the Substantiation provides a reason for stating, or believing the Assertion. In his account of Semantic Clause relations, Winter refers to this relationship as Statement - Reason (Winter, undated). Ross (1970) arguing for the existence of an implicit performative verb in statements, points out that in the sentence,

'Jenny isn't here, for I don't see her'

"It is clear that the for-clause ... does not provide a reason for Jenny's absence .... but rather a reason for the speaker to assert that she is absent" (p. 248).

In order to describe this relationship accurately, Dakin's standard form for causal explanations would have to be altered considerably. The standard form for a typical, causal explanation is,

I state S_2

I state S_1 caused S_2

This would have to be altered to,

I assert S_1

(I assert S_1) because S_2

/6.2.2.1.

6.2.2.1. Similarity between Explanations and Substantiations: Substantiations share several formal features in common with Explanations, as can be seen when we compare the following pair of texts:

1. Explanation: He's deaf. His eardrum was punctured in an accident.

2. Substantiation: He's stupid. He loses all his money at cards.

(i) In each case, the separate utterances can be joined by 'because' or 'since'.

(ii) If the order of utterances is reversed, in each case they can be joined by 'so'.

(iii) In the original order, the second utterance can be elicited by the question 'Why' being asked of the first utterance.

6.2.2.2. Differences between Explanations and Substantiations: There are, however, certain obvious differences, some of them formal:

(i) The two separate utterances in the Assertion - Substantiation relationship can be linked by conjunctions such as 'in that', 'in as much as', 'in so far as', eg.

'The brain is unusual in that it consists of several pairs of ganglia all fused together'

Most instances of 'Statement - Explanation' can not be so linked, eg.

*'The car stopped in that the brakes had jammed. [1]

(ii) An Explanation is a description of an event, or state of affairs,

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1. However, in Dakin's example,

'I concluded that John was the murderer because he was the only one with the means, motive and opportunity'

'in that' can be substituted for 'because', although the clause 'he was the only one..etc.' is here an explanation of a fact rather than a substantiation. It looks as if expressions such as 'in that' are markers of some kind of inferential reasoning.

considered

distinct from the event or state of affairs it explains. The order of utterances can be reversed and linked with 'and' without the interpretation of the whole utterance being altered, eg.,

'The car stopped. The brakes had jammed.'

'The brakes had jammed and the car stopped.'

Pragmatically the second example will be interpreted as meaning the same as the first, on a 'post hoc, ergo propter hoc' line of reasoning.

However, in the case of the Assertion - Substantiation relationship, even when at first sight there appear to be two events described, this is not the case, and the corresponding 'paraphrase' does not, in fact, mean the same, eg.,

'The judge misdirected the jury. He referred them to only a limited amount of evidence'

If this is altered, we get,

'The judge directed the jury to only a limited amount of evidence, and he misdirected them'

which suggests that the judge misdirected the jury <u>in addition</u> to a previous action.

We can often say that, rather than describing a different event from that described in the Assertion, the Substantiation part 'constitutes' what is asserted in the first part, or that what is asserted 'consists of' what is stated in the substantiation, eg. The judge's misdirection <u>consisted of</u> directing the jury to certain kinds of evidence, OR The judge's directing the jury to only certain kinds of evidence <u>constituted</u> his misdirection.

/6.2.2.3.

6.2.2.3. The Function of Substantiations: It has already been argued that substantiations provide a reason for uttering the preceding assertion. That is, they provide evidence as to why, in the writer's opinion, his assertion is true. They can thus be related to Searle's 'Preparatory' condition for a successful assertion, namely, that the utterer has a basis for believing the proposition contained in the assertion (Searle, 1969). Thus substantiations are likely to occur in those cases where the writer makes an assertion which he believes may not immediately be accepted as true by the reader. This again marks substantiations off from explanations, which, as Dakin remarks, 'answer or anticipate questions about why somethihg happened or why something is as it is' (Dakin, 1969: 199). That is, there is, in the case of Explanations, no reason to assume that the Listener/Hearer will disbelieve what is stated.

Explaining the function of Substantiations by reference to factors in the communication situation such as possible non-acceptance of the Assertion by the reader has the advantage of making it possible to subsume into a single class two rather different types of Substantiation, exemplified by the following pair:

1. Jenny is not here, for I don't see her.
2. The brain is unusual in that it consists of several pairs of ganglia.

The first is clearly a form of inductive inference, arguing from the known to a probability; the second is rather different - 'The brain is unusual' might conceivably be classed as a generalization. However, the account given here of the function of Substantiations allows both examples

/to

to be classed as such.

What types of utterance are liable to be followed by Substantiations? Lackstrom, Selinker and Trimble (1972), whose description of 'core generalizations' in EST. paragraphs shares much in common with the discussion here, consider that such generalizations, which they view as forming the basis for EST paragraphs, make claims that are 'worthy of support' (p. 14). If they do not do this, then they are 'trivial', false only if the author is lying. An examination of examples of Assertion - Substantiation pairs reveals that the Assertion often contains 'subjective' terms, eg. 'is confusing', 'presents a definite advance', 'is unusual' 'has some basis', 'is a plain piece of administrative nonsense', etc. This is probably important for purposes of prediction, since the reader, coming upon such subjective assertions, is likely to be able to predict the occurrence of a subsequent substantiation. Not all assertions, however, are marked by the presence of overtly subjective terms[1], eg.,

'Jenny is not here (for I don't see her)'

'It is not fully automatic (in that the trigger has to be pressed for each shot)'

In these cases, what look like objective statements are only revealed as assertions by the presence of the ensuing substantiation.

6.2.2.4. Importance for Texts: Lackstrom, Selinker and Trimble claim that the typical E.S.T. paragraph, whether a physical one, i.e. marked

/by

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1. Although the use of 'in that' appears to be more appropriate when the Assertion is overtly subjective; compare,

?'Jenny is not here in that I don't see her

and,

'Jenny can't be here in that I don't see her.

by line indentations, or a 'conceptual' one, ie. forming a complete 'unit of discourse' whether formally marked by indentation or not, consists of a 'core generalization' together with supporting statements (pp. 6 and 7). While the relationship Assertion - Substantiation is a broader one than that of Generalization - Supporting Statement(s), since the Assertion may or may not be classifiable as a 'generalization', the claim made by Lackstrom et al for the importance of core generalizations with respect to E.S.T. paragraphs holds good for the role played in general expository texts by the Assertion - Substantiation relationship. That is, paragraphs in such texts are very often built up of an initial Assertion, followed by one or more Substantiations. In fact, in the expository texts examined during the course of this study, this relationship was found to be vastly more important than that of Statement - Explanation. Thus it provides a useful base for an analysis of the structure of expository texts.

6.2.3. Assertion - Concession: This is the relationship holding between the first sentence in each of the following texts and the subsequent sentence(s):

1. There are, however, several important characteristics which show that Amphioxus is really a primitive relative of the vertebrates. This little animal has no backbone, no series of vertebrae running the length of the back and stiffening the trunk: (it has, however ...)

2. But in practice Labour politicians in office have been consistently tough with the unions. The previous Labour government did back away from 'In Place of Strife' under union pressure; (but...)

3. The First-Aid man is the member of this trio who merits most

/consideration

consideration. He is professionally conservative. Moreover, he tends to follow the book and puts great weight on the immutable truth of the printed word, (but...)

Concessions are in a sense the opposite of Substantiations. If Substantiations provide the writer's basis for making his Assertion, Concessions spell out either reasons for <u>not</u> making the statement, ie. the reason why the assertion may not be valid, or anticipate the reader's objections to the validity of the Assertion. Thus, in Example 1 above, the fact that Amphioxus has no backbone, etc., might be taken as evidence that the creature is <u>not</u> a primitive relative of the vertebrates.

6.2.3.1. <u>Different Forms of Concession</u>: The frequent combination of 'Assertion - Concession - Substantiation' can appear in several forms. Thus the following are all possible:

1. The First-Aid man merits most consideration. He is conservative, But he is the man who has to do the job.

2. The First-Aid man merits most consideration. I admit/ admittedly he's conservative; he is, however, the man who has to do the job.

3. The First-Aid man merits most consideration. While he's conservative, he is the man who has to do the job.

The order in which the different utterances appear is, however, important, particularly when the Concession is unmarked apart from the presence of 'but'. For example, the following sequence,

'That house is almost ideal for us. It's very far from my work, but it has lots of room'

/gives

gives the impression that the speaker intends to take the house, whereas the sequence,

'That house is almost ideal for us. It's got lots of room. But it's very far from my work'

suggests that the house's disadvantages are uppermost in the speaker's mind.[1] It seems likely that in the second text, the final sentence is not a Concession, but a contrary assertion. Concessions must be subordinate.

6.2.3.2. Marking of Concessions: While the Concession element itself may be overtly marked by such terms as 'admittedly', 'granted' etc., this is not obligatory. In the common configuration of 'Assertion - Concession - Substantiation', the most common practice seems to be to mark the disjunction of Concession and Substantiation, with 'but', 'while' or 'although'.

The use of 'but' to show rhetorical disjunction seems to account for some of the problems in Robin Lakoff's discussion of the uses of 'but' (Lakoff, 1971). She claims that in cases where 'but' joins two propositions which do not contain semantically opposed items, the listener has to supply a presupposition to explain the usage. Thus,

'Gold is soft but iron is hard'

requires no presupposition, because of the presence of the hard/soft opposition, whereas,

'She was poor but she was honest'

requires the presupposition, 'poor ⊃ not honest'.

/On

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1. Punctuation also plays a part. Concessions are often found in the same orthographic sentence as Substantiations, the two elements being separated by a comma, a semi-colon or a colon.

On the other hand, Lightfoot (1973) has produced counter-examples such as,

'He's tall but he's a basket-ball player'

where it is obviously untrue that 'tall ⊃ not a basket-ball player'. Such disjuncts are perfectly normal in contexts such as,

'Mary likes John. He's tall, but he's a basket-ball player'

which is easily analysed as 'Statement - negative Reason - Explanation', ie., the statement that Mary likes John is followed by a reason why she should not like him (she doesn't normally like tall men) followed in turn by an explanation as to why she in fact does (she just adores basket-ball players). Similarly, in the example,

'Dolores McGregor would make a good wife. She talks too much, but she's a marvellous cook'

the 'but' is explicable as showing the disjunction between a Concession, providing evidence as to why she would not be a desirable wife, and the Substantiation, providing overriding evidence that she would. Thus the 'but' marks the relationship between the rhetorical units, and not between the semantic content of these units.

Lakoff has suggested that there are restrictions on the use of 'although' in transforms of 'S_1 but S_2'. Her suggestion is that 'although' is confined to cases involving presuppositions, and is not used where 'but' marks the disjunction of semantically opposed items. Thus she rejects,

'Although John is rich, Bill is poor.'

while accepting,

/'Although

'Although John is rich, he is honest.'

However, the first example appears to be quite acceptable in the context,

'Not all the Smiths are rich. Although John is rich, Bill is poor'.

Again it seems that the restriction, if there is one, is more easily explained by an appeal to rhetorical relationships, rather than semantics.

A speculative explanation as to why 'although' is odd in cases like,

'Although iron is hard, lead is soft'

but acceptable in larger contexts such as,

'Not all metals are hard. Although iron is hard, lead is soft'

is that the grammatical subordination imposed by 'although' reflects, or imposes a rhetorical, or psychological subordination. In the sentence, 'Iron is hard but lead is soft' both assertions seem to be of equal importance, and the subordination of one to the other is incongruous. When one assertion becomes a Concession, however, as in 'Not all metals are hard. Although iron is hard, lead is soft', the Concession, giving a reason for not accepting the main Assertion, is rhetorically, or psychologically subordinate to the Substantiation, and hence can be preceded by 'although'.

6.2.3.3. Difficulties Brought About by Concession in the Reading Process: A possible difficulty that Concessions are likely to provide for the unwary reader arises from the fact that they are in themselves often not marked. Thus they may initially be taken as Substantiations. Consider the full version of a text already quoted:

/'There

'There are, however, several characteristics which show that Amphioxus is really a primitive relative of the vertebrates. This little animal has no backbone, no series of vertebrae running the length of the back and stiffening the trunk; it has, however, a fairly effective substitute in a structure occupying the same position, known as the notochord'.

It seems at least possible that a reader coming to this text unprepared, and lacking certain information about biology, would read the Concession as a Substantiation, ie. would interpret lack of backbone or vertebrae in the spine as being characteristics Amphioxus shares with vertebrates. He would then have to revise his interpretation on reading the true Substantiation.

This, however, is simply one manifestation of the confusion likely to arise when relationships are not marked and the reader is unfamiliar with the material. It is probably significant that Winter (1968) found relationships marked more frequently in college text-books.

Another possible difficulty is that in the common configuration, 'Assertion - Concession - Substantiation' the Concession stands between the Assertion and the evidence required by the reader before he accepts the truth of the Assertion. Sometimes a block of Concessions can occupy the greater part of a paragraph, which means that the reader must hold the Assertion until he arrives at the Substantiation at the end of the paragraph. It is thus possible to hypothesize that a text containing a relatively high proportion of extended Concessions may be difficult to grasp.

6.2.4. Exemplifications: This is the relationship holding between the

/two

two utterances in each of the following pairs:

1. And once the birds arrive, they seem to adapt quickly to city life. Tawny owls, for example, are finding that their natural food - mice and voles - are very plentiful in the concrete jungles.

2. Fish often have their own regional names. Saith - the commonest variety after the top three - may be called coal fish, coley, and a whole host of local names from cooth to prinkle.

In his outline of 'Semantic Clause Relationships' Winter groups Generalization - Exemplification as a Matching Relationship, ie. produced by means of replacing one or more item or unit in the Generalization with matching items in the Exemplification (Winter: undated). Certainly this is quite illuminating when one considers the <u>construction</u> of an Exemplification. In the above instances, the following 'matching' can be detected:

	<u>Generalization</u>		<u>Exemplification</u>
1.	they (the birds)	-----	tawny owls
	seem to adapt quickly	-----	are finding that their natural food - mice and voles - are very plentiful
	to city life	-----	in the concrete jungles
2.	Fish	-----	Saith - the commonest variety after the top three -
	often have their own regional names	-----	may be called coal fish, coley, and a whole host of local names, from cooth to prinkle.

/Such

Such matching probably plays a part in comprehension. The replacement of 'fish' with 'saith', for instance, is probably sufficient to indicate to a reader that 'saith' is a kind of fish, even when he was previously ignorant of the meaning of the word.

From the standpoint of the functional analysis adopted here, however, Assertion - Exemplification is probably best treated as a sub-class of Assertion - Substantiation. The former relationship is more limited in that it can occur only when the Assertion contains a reference to a class of objects or events, eg.,

'John was late this morning' No class reference, therefore no Exemplification possible.

'John was late several times this week. For example, on Tuesday, he didn't turn up till 9.30'.

Generally speaking, given an Assertion containing a class term, we can substantiate it in two ways. First, we can list some or all of the members of the class:

'Despite all our differences, Australia is still more like Britain than any other country. We both drive on the left hand side of the road, go dog-racing, watch Callan and Alf Garnett, play cricket, read the same books, say 'lift' rather than 'elevator' ....'

or we can select one or more members of the class to exemplify the class as a whole:

'Despite all our differences, Australia is still more like Britain than any other country. For example, we both drive

/on

on the left hand side of the road and go dog-racing'.

The 'For example' informs the reader that there is more evidence in hand which, for convenience, is being held back.

Sometimes, as in the 'Fish' example above, no marker is present, but the second part of the utterance is obviously intended as an Exemplification, not as a complete Substantiation. Sometimes, however, it is virtually impossible to decide whether an unmarked utterance is intended as a Substantiation or an Exemplification, and probably futile to try. For instance, in the following text,

> 'Environmental agencies can interfere with the development of sex characteristics. In some mammals, the presence of a twin of opposite sex in the womb can cause the development of a mixture of male and female organs.'

the two sentences could be linked with either 'in that' or 'for example'. The choice, in the absence of any marking by the author, depends on our knowledge of the subject area. If the second sentence contains all the evidence for the truth of the first assertion, then it is a Substantiation. If not all the evidence is contained in the second sentence, then it is an Exemplification.

As with all rhetorical relationships, the relationship of Assertion - Exemplification imposed on material depends at least in part on the writer's views. In the following text,

> 'Actually the size of a head has nothing to do with brain capacity. The Royal Family have mostly small heads'

the second utterance is probably an Exemplification, but the

/appropriateness

appropriateness of the relationship might not be accepted by an anti-royalist.

6.2.4.1. Difficulties in Reading Exemplifications: The Exemplification part of the Assertion - Exemplification relationship often requires to be paraphrased quite radically before the 'matching' referred to by Winter becomes overt. For example, in the following text,

> 'More obviously, increasing human numbers, and the expanding need for more agricultural land, have led to the destruction of forests over vast areas. Britain and Western Europe, for instance, were formerly for the most part forest lands except in the higher mountains, but only relatively small wooded patches now remain',

the Exemplification, in order to 'match' the Assertion, has got to be paraphrased as,

> 'The forests which covered most of Britain and Western Europe have now been almost entirely destroyed.'

Sometimes, in order to get the Assertion and Exemplification to match, the reader must supply some implied material, as in the following text:

> 'Some extinct civilizations seem to have been helped on their way by the disappearance of their agricultural resources. The Maya civilization of Guatemala created deserts by the destruction of forests.'

Here the following 'matches' are immediately detectable:

Some extinct civilizations	---	the Maya civilization of Guatemala
the disappearance of their agricultural resources	---	created deserts by the destruction of forests

The reader must supply the information that, by destroying the forests, the

/the

Mayas 'helped themselves on their way' (to extinction).

6.2.5. Common Features of the Relationships.

6.2.5.1. Binary Characteristics: The above description of a very limited number of inter-sentence relationships has much in common with Winter's description of 'Semantic Clause Relationships'[1] (cf. Chpt. 2). As in Winter's description, the relationships here are binary, although, again as in Winter, one rhetorical 'unit' can simultaneously enter into more than one relationship. Thus one unit may stand as a Concession with respect to another, but itself be supported by a Substantiation, in relation to which it is therefore an Assertion, eg.,

1. Assertion 2. Concession 3. Substantiation of 2 4. Substantiation of 1.

This is the situation in the following text (units are numbered for convenience of reference):

> 1. 'Life in these prehistoric communities must have been rather pleasant. 2. Hygiene had not been invented 3. and and the mortality rate must have been very high. 4. Moreover, economically, life was precarious. 5. If the hunting was not successful, the people died of starvation. 6. But if life was short, at least it was free.'

This can be analysed as:

/1. Assertion

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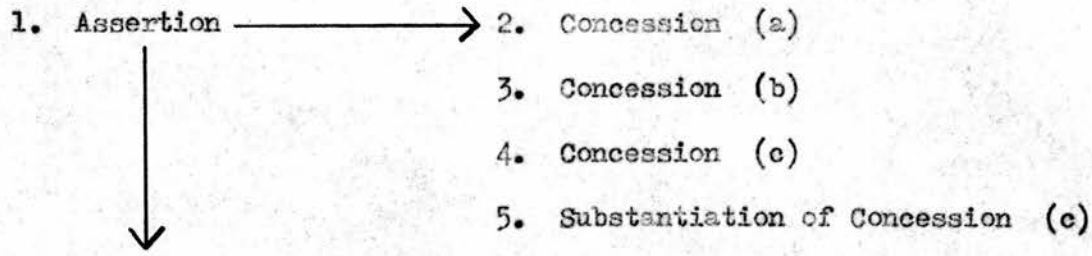
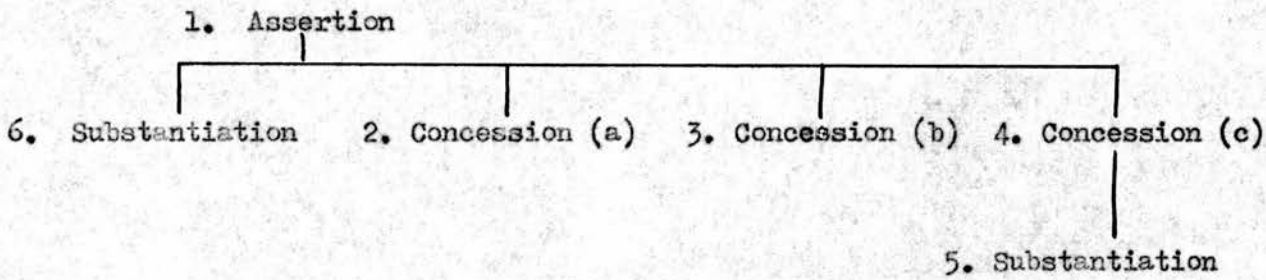
1. But the account of Exemplification given here cuts across Winter's classification of relationships into 'Matching' and 'Logical Sequence' types. For Winter, Exemplification is a 'Matching' relationship, whereas here it is treated as a subclass of Assertion-Substantiation, which Winter would include under 'Logical Sequence'.



6.2.5.2. Hierarchical Nature: The above analysis suggests that it is possible to view texts of this type as being structured hierarchically, with primary Assertions at the top, followed by Substantiations, Concessions and Exemplifications at a lower level, and Substantiations of these at a third, even lower level. Thus the hierarchical structure of the text above could be diagrammed as follows:



Whether it is possible to extend this to a claim that such a hierarchical description reflects the intentions of the writer, ie. that top-most Assertions represent his 'main message' and that items lower in the tree represent less essential parts of his message is speculative. However, it can plausibly be argued that Exemplifications at least are intended to be subordinate in importance to the Assertions they support.[1] And if the account given here of the function of Substantiations is accepted, then it is not implausible to claim that a reason for making an Assertion is

/subordinate

1. Lackstrom, Selinker and Trimble (1972) describe the structure of EST. paragraphs as hierarchical on a similar basis, namely, that a 'core generalization' is more important than the statements that support it.

subordinate in total importance to the Assertion itself. The same is true for Concessions. Certainly, such a view of the structure of texts would seem essential for an approach to summary based on text-structure.

Some support for the view can be found in the work of Werner and Kaplan (Werner and Kaplan, 1963). They use the linguistic distinction between 'paratactic' and 'hypotactic' structures to divide experience of events, and its subsequent expression in linguistic form into two types, 'paratactic' and 'hypotactic'. In paratactic expressions, events are described as co-occurrent or in sequence. The use of 'and' or 'and then' is a typical paratactic link between clauses. In hypotactic expressions events etc. are described in terms of 'a causal or conditional relationship, that is, one event may be dependent upon or subordinated to the other.' (p. 171). They claim that 'paratactic' utterances occur first in the child's language development, are then extended to cover hypotactic experiences as well, and are then replaced in that area by hypotactic expressions such as 'A because B'.[1] Some evidence for this claim has been put forward by Katz and Brent (1968). They found that in their expression of Causal events, younger children tended to prefer 'and then', whereas children in an older age group used 'because' and 'therefore'.

It could be argued, then, that the inter-sentence relationships discussed here are hypotactic forms, and reflect the author's view of the relative importance of different sections of his material. It could also be argued that, if paratactic expressions precede hypotactic

/ones

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1. Their claims must, however, be treated with some caution. For example, they consider that the utterance 'The toy is broken - it doesn't move' is a paratactic utterance, preceding in the child's linguistic development the hypotactic 'It doesn't move because it's broken.'. From the point of view of sentence relationships taken here, however, the first utterance is a perfectly normal instance of Assertion - Substantiation.

ones in the child's linguistic development, then paratactic structures will be easier to comprehend than hypotactic structures.

6.3. Paratactic and Hypotactic Texts: The terms 'paratactic' and 'hypotactic' can be employed to distinguish two types of expository texts. In hypotactic texts, inter-sentence relationships of the type discussed in this chapter are predominant. In paratactic texts, such relationships are absent, and the separate sentences can only be linked by 'and' or sometimes 'zero'. As an example, the first text below is a hypotactic one, the second is paratactic. Rhetorical units are numbered:

A. (1) One of the most obvious of the characteristics that may be said to be inherited is sex. (2) Granted, environmental agencies can interfere with the development of sex characteristics: (3) in some mammals the presence of a twin of the opposite sex in the womb can cause the development of a mixture of male and female organs; in other words, the production of an inter-sex. (4) But in normal development sex is determined by the chromosomes by a simple mechanism.

Unit 1 and Unit 4 comprise an Assertion - Substantiation, ie., 'Sex is an acquired characteristic in that it is determined by the chromosomes'.
Unit 2 is a Concession, and is marked as such by 'granted'.
Unit 3 is either a Substantiation of 2 or an Exemplification. It can be linked to Unit 2 by either 'in that' or 'for example'.

B. (1) The most spectacular of the onslaughts on our crops are those due to locusts; (2) there are seven species (3) and between them they cover the Americas, Africa, the Near East,

/central

central Asia, India, China, Indonesia and Australia.

(4) Unwise cultivation may increase the number of swarming grounds. (5) In the Americas plagues of the related grasshoppers cause similar damage as well.

Here there are no instances of the kinds of inter-sentence relationships discussed in this chapter. Each unit is more or less independent of the other. The only possible link between units would be 'and' or one of its equivalents.

It should be stressed that it is often not possible to characterize long stretches of prose as either paratactic or hypotactic. The two texts above are taken from the same book ('The Human Species' by A. Barnett) and occur relatively close to each other. All one can normally do is to class a short section of text as predominantly hypotactic or paratactic. Certain types of writing, however, such as persuasive expository material, newspaper editorials etc. often contain a high proportion of hypotactic material.

6.4. Experiments with Hypotactic Texts: In the previous two experiments, each member in a pair of experimental texts was as far as possible identical in information content to the other; the texts differed from each other mainly in linear ordering of propositions. With hypotactic texts, however, this method of testing the relative efficiency of different forms of organization is seldom possible. The reason is that inter-sentence relationships are often dependent on linear order. An Exemplification, for instance, must follow the corresponding Assertion if the relationship is to hold. If the order

/of

of units is reversed, then the relationship is generally lost: eg.,

'Fish often have their own regional names. Saith may be called coal fish or coley'

'Saith may be called coal fish or coley. Fish often have their own regional names'

In the second pair of sentences above, the Assertion - Exemplification relationship appears to have been lost, and the second sentence in the reversed order appears to function as a sort of parenthetical generalization: ie. (Fish, in fact, often have their own regional names).

For this, and similar reasons, it was judged impractical to compare the readability of two hypotactic texts, containing the same information content but differing in linear organization. What was done in Experiment 3 (cf. Chpt. 7) was to compare the readability of a hypotactic text with a paratactic text of the same length, same readability index, and containing as much of the information content of the hypotactic text as possible. A possible hypothesis was that the greater complexity of the inter-sentence relationships in the hypotactic text would result in its being more difficult to read.

The largely optional marking of inter-sentence relationships has been noted occasionally in the course of the discussion in this chapter. In Experiment 4, (Chpt. 8), marked and unmarked versions of hypotactic texts were compared, the hypothesis being that marking, by making overt the sentence relationships, would make the text as a whole easier to read.

CHAPTER 7

LOGICAL PRINCIPLES:

'HYPOTACTIC v PARATACTIC' TEXTS

7.1. Introduction: In the light of the preceeding discussion, it was decided to test whether a text the sentences of which are linked paratactically differs in readability from a text of the hypotactic type; that is, whether a text in which the sentences are linked by relationships of the 'AND' type is harder or easier to read than one in which the sentences are linked by relationships of the 'IN THAT' type.

At first glance, it seems at least possible that the differences between the two types of text should affect their relative readability. For example, let us look at two short texts:

1. Paratactic: 'The woodpecker is an arboreal bird. It bores holes in trees.'
2. Hypotactic: 'The woodpecker is an unusual bird. It bores holes in trees.'

It might be argued that when reading the first sentence of Text 2, the reader is cued to predict the general nature of the next statement, in a way that is not done by the first sentence of Text 1. That is, the use of the word 'unusual' sets up the reasonable expectation that the following part of the text will contain some justification for the use of this term. He will, in other words, expect to be told why the woodpecker is considered unusual. The reader of the first sentence of Text 1 does not have a cue of this type. All he may reasonably expect is that the next sentence will contain more information about the

/woodpecker

woodpecker. Thus if reading speed is increased by successful prediction, then Text 2 might be read faster than Text 1. As far as recall is concerned, one might expect here also that the greater coherence between the two statements of Text 2 should aid the reader. That is, if he initially remembers only

'The woodpecker is an unusual bird.',

then the close link in the text between this sentence and the next may help to trigger his subsequent memory of the second sentence. This seems not so likely to happen with the first text.

An alternative view might be that since Text 2 contains an implicit relationship between its two sentences which is lacking in Text 1, then this might make Text 2 more difficult. That is, the reader of Text 1 has one less relationship to grasp and his task is lightened. This view of the difficulty of processing relationships might seem to get some support from Bever's findings (Bever: 1970) that propositions were accurately remembered after the relationships between them were lost.

Thus arguments can be produced to suggest either that texts of the type of 1 above should be easier than texts of the type of 2, or the reverse. The experiments described in the following sections were conducted to test the general hypothesis that there should be a difference.

7.2. Justification for the Experiments: Apart from academic interest, the experiments can be justified by claiming that if a difference were found, then this would be relevant to the application of Readability formulae in schools. Hypotactic structures are very common, particularly in texts which can loosely be described as 'argumentative'. It seems

/reasonable

reasonable to expect that texts of this nature will be met with more frequently as the pupil progresses in the school. Standard Readability formulae make no allowances for the differences between the two types of text, and this would be a problem if it was found that, for example, texts of the hypotactic type were consistently more difficult than those of the paratactic type. Thomas and Augstein's findings (Thomas and Augstein, 1972), that subjects' success in reading was improved by specific training in recognizing relationships in a text might seem to suggest that texts of the hypotactic type present special difficulties and require special training.

It must be admitted, however, that in testing the relative readability of Hypotactic as opposed to Paratactic texts, we are diverging considerably from the line taken in the two previous experiments. There, the approach was to examine descriptions of how writers present information of a specific type, or prescriptions as to how they should present such information, and attempt to assess how valid these were in terms of the readability of the texts that resulted from their application. The organizational principles involved mainly the order of sentences or statements inside the text. Apart from this variation in statement order, and some consequent alterations in pronominalization, etc., the pairs of texts produced for these experiments were very similar. On the whole, as far as this could be arranged, they contained the same information. Moreover, they could be viewed as likely to occur in identical contexts, with the same function, namely the imparting to the reader of the factual information that they contained. In the case of one form of organization resulting in a text which could be proved to be more readable than another,

/then

then this information could be offered to the would-be writer. 'Given a body of information X, and two ways of organizing it, 'a' and 'b', then 'a' gives better results in terms of the readability of the resultant text.'

The same situation does not occur in the case of two texts which differ in that one contains a hypotactic form of organization while the other contains a paratactic form. In all probability they will be quite different texts. Not only are they likely to differ considerably in the information that they contain, they are also likely to occur in different communicative contexts, and be intended to perform different functions. It has already been argued (cf. 6.2.) that a text of the form "A + 'and' + B" is likely to be addressed to an audience who are thought by the writer to be ignorant of either A or B, but who are unlikely to disagree with either statement once it has been brought to their notice. Texts of the form 'A (IN THAT) B', on the other hand, are delivered on the assumption that the audience not only do not know 'A' but are not likely to believe/understand it unless it is backed up by 'B'. It is not just a matter of different types of organization, therefore, but of different texts in different contexts. Thus, one of the jusitifications for the general approach - the 'advice to writers' aim - is lacking here. One must therefore fall back on a 'pure' investigation of comparative readability.

7.3. First Experiment.

7.3.1. Method.

7.3.1.1. Preparation of Texts: Six pairs of texts were used, each pair

/being

being assigned a title, as follows:

1. City Life
2. The Lopsong
3. Birds in Cities
4. Political Candidate
5. The Jewish People
6. Summer in the Arctic

There were initially 6 texts, of which Texts 1 and 3 were based on an article in the magazine 'Weekend', and 5 on a passage in Barnett's 'The Human Species' (Penguin Books, 1968: p. 177). The other three texts were made up specially for this experiment. Since in their case no Primary Passage exists, while in the case of Texts 1, 3 and 5, the Experimental Passages differed considerably from the Primary Passages, it seems simplest on this occasion to begin the account of text construction at the Experimental Passage Stage.

Each of the 6 texts contained several instances of hypotactic relationships. These hypotactic texts will from now on be referred to as 'A' texts. Text 5A appears below as an example; the other five 'hypotactic' texts are presented in Appendix 5.

5A

The Jewish People

The facts about Jews are not well-known and are worth summarizing. It may be that if more people are made aware of them, there will be less prejudice and much suffering may be averted. The Jews today cannot be said to form a nation (except

/in

in Israel). Jewish people belong to many different nations in the modern world, including our own. Nor are they at all uniform in physical features. Not all Jews have the so-called 'Jewish nose', while lots of people who are not Jews do have noses like this. Like most people, many Jews are dark, but a surprising number are red-headed. There is a wide-spread belief that it is possible to identify Jews by their appearance. When this is put to the test, however, a very large number of errors are made. The people tested often fail to identify Jews as such, and they may identify as Jews people who are not Jews at all. For example, they often identify Armenians as Jews.

7.3.1.1.1. Analysis of the Relationships in Passage 5A: The hypotactic relations present in this text appear to be those of 'Assertion - Substantiation' and 'Assertion - Exemplification'. These relationships can be made overt by adding the markers 'IN THAT' and 'FOR EXAMPLE' in front of Substantiations and Exemplifications respectively, as follows:

1. The facts about Jews are not well-known and are worth summarizing
2. IN THAT it may be that if more people are made aware of them, there will
3. be less prejudice and much suffering may be averted. The Jews today
4. cannot be said to form a nation (except in Israel) IN THAT Jewish
5. people belong to many different nations in the modern world, including
6. our own. Nor are they at all uniform in physical features FOR EXAMPLE
7. not all Jews have the so-called 'Jewish nose', while lots of people
8. who are not Jews do have noses like this (and) FOR EXAMPLE like most
9. people, many Jews are dark, but a surprising number are red-headed.
10. There is a wide-spread belief that it is possible to identify Jews by
11. their appearance. When this is put to the test, however, a very large

/12.

12. number of errors are made IN THAT the people tested often fail to
13. identify Jews as such, and they may identify as Jews people who are
14. not Jews at all. FOR EXAMPLE they often identify Armenians as Jews.

Thus it is claimed in the analysis, for example, that the author backs up his assertion that the facts about Jews are 'worth summarizing' by stating that such a summary may help decrease prejudice, etc. It must be admitted that the analysis is subjective. Some of the interpretations of relationships are obvious enough - Armenians as an example of non-Jews who are often identified as being Jews, for instance. Some of the relationships are perhaps not so obvious. It might be thought that the IN THAT of line 12 should be replaced by 'FOR EXAMPLE'. The former relationship was chosen on the grounds that both possible types of 'error' are covered in the subsequent statements.

As a check on the analysis, a group of adults were given the 'A' texts between statements considered to be joined by hypotactic relationships, and asked to fill the gaps with either 'in that', 'eg.', 'because', 'admittedly', 'and', 'but' or '—'. In those cases where a wide measure of disagreement emerged, the texts were altered to take this into account.

7.3.1.1.2. Construction of the Paratactic 'B' Texts: The aim was to construct texts which retained as much as possible of the form and content of the 'A' texts but in which paratactic relationships between statements were substituted for the original hypotactic ones. Sometimes this could be effected with very little change to the 'A' version; for example, the relationship between the following pair of sentences from Passage 6A,

'During these months the Eskimos live a pleasant life. In contrast to the permanently dark winter days, the sun shines and

/the

the air is remarkably warm.'

could be altered to a paratactic relationship by changing 'a pleasant life' to 'in deerskin tents'. Sometimes an entirely new sentence had to be substituted for one of the hypotactic pair. Thus the second sentence of the following pair from Passage 5A,

> 'The Jews today cannot be said to form a nation (except in Israel). Jewish people belong to many nations in the modern world, including our own.'

was replaced by the sentence,

> 'And even in that country, a sizeable number of the citizens are not Jewish.'

Sometimes it did not seem practicable to retain even one member of a pair in its original form; one of them was then replaced with a new sentence containing as many features as possible in common with the original. For example, the sentence from Passage 5A,

> 'Like most people, many Jews are dark, but a surprising number are red-headed'

was replaced in 5B by the sentence,

> 'Most Jews today live in the West, but a surprising number are orientals.'

It must be admitted that in the interests of producing a set of 'B' texts that were cohesive and 'natural', a great deal of alteration had to be carried out, so that the 'B' texts often differed considerably from the 'A' texts. As an example of the 'B' texts, Passage 5B is reproduced

/below.

below. Those segments of it which are identical to corresponding segments of the 'A' text are underlined. The other 'B' texts are to be found in Appendix 5.

5B.

The facts about Jews are not well-known and are worth summarizing. The Jews were originally a tribe, or group of tribes, living in Palestine, but they were finally expelled from there by the Romans. The Jews today cannot be said to form a nation (except in Israel). And even in that country a sizeable number of the citizens are not Jewish. Nor are Jews at all uniform in religious beliefs. People think of Jews as mainly working in business, but this is because Jews were often not allowed to own land. Most Jews today live in the West, but a surprising number are orientals. There is a wide-spread belief that it is possible to identify Jews by their appearance. When this is put to the test, however, a very large number of errors are made. In the past people have accused the Jews of being responsible for all the misfortunes that countries suffered, from wars to bad weather. Nowadays these accusations are considered to be nonsense.

This text contains one causal relationship, in Sentence 6. Apart from this, all sentence relationships are of the coordinate type.

7.3.1.1.3. 'A' and 'B' Versions Compared in Terms of Fog Readability Indices: Each sentence in the 'B' text was equal in length to the corresponding sentence in the 'A' text. For example, in the two versions

/of

of Text 5 given above, the first sentence of each contains 17 words. The second sentence of each contains 19 words, and so on. Moreover, each sentence contained the same number of words of more than 2 syllables. As a consequence, the Fog Indices of each pair of texts were identical. In fact, the procedures described above were more than was strictly necessary to produce two texts with the same Fog Index, since for that, it would have been necessary only for each text of a pair to contain the same overall number of words and same overall number of words of more than two syllables. Each text may thus be viewed as a collection of sub-texts, each one sentence long, and equivalent in reading difficulty, according to the measures employed by the Fog Index, to the corresponding sub-text in the other member of the pair. This is important since the marking schemes for the recall answers were devised on a sentence basis.

There were thus six pairs of texts, each member being equivalent to the other in the pair as far as readability as measured by the Fog Index was concerned. The length of each pair of texts, and the Fog Index of the pair, is given in Table 6 below:

Table 6

Passage	1	2	3	4	5	6
Length in No. of words:	147	143	125	137	167	141
Fog Index:	9	14	10.4	15	11	8.4

7.3.1.2. Tests: Two tests were used, the Intrusive Word Test, for speed and comprehension, and a Free Recall Text. Details of the Intrusive Word Tests are presented in Appendix 1.

/7.3.1.3.

7.3.1.3. Marking of Recall Scripts: The Recall answers in this experiment presented problems of marking that had not arisen in the previous two experiments. Since the marking scheme is an integral part of the test construction, it will be discussed here, rather than later on.

Basically the problem consisted of the fact that in this experiment, the 'A' and 'B' texts in each pair contained different information. In the previous two experiments, and in Experiment 4, this was not the case. In Experiment 1, for example, the same sets of events were described in the 'A' and 'B' versions of a text, the difference between the texts consisting of the order of mention of the events. In such a case, it is relatively simple to construct a marking scheme which allots marks to recall of the material common to both versions of the passage. Given, for instance, the following two texts,

1. He lit a cigarette after he finished working.
2. He finished working before he lit a cigarette.

it must be admitted that whatever the differences between them, they contain the following information in common,

(i) He lit a cigarette.
(ii) He finished working.
(iii) Action (i) followed action (ii) or
Action (ii) preceded Action (i).

It is thus comparatively simple to construct a common marking scheme, by which to assess the relative ease of recall of each text, or rather the ease of recall of the common material contained in each text.

In the texts used in Experiment 3, however, no such common marking scheme for each pair of texts was possible. Each member of a pair

/contained

contained a considerable amount of information not shared by the other member. It thus became necessary to assess, for example, whether a subject recalling Passage 5A had recalled 'Much suffering may be averted' as well as a subject recalling Passage 5B had recalled 'The Jews were originally a tribe'. It is by no means clear whether it is possible to perform this assessment in a valid way.

The following scheme was adopted. It will be remembered that each member of a pair of Experimental Passages in this experiment was not only the same length as the other member of the pair, but also consisted of the same number of sentences, each of the same length in number of words as the equivalent sentence in the other passage. It was thus possible to treat each sentence as a unit and to assess its recall relative to recall of the equivalent unit in the opposite text.

However, even an individual sentence of the length found in these texts is too long to serve as a useful single unit. It was therefore decided to sub-divide each sentence into a Referent and a Predicate. The Referent is what the sentence is about, the Predicate is what is said about the Referent. Thus when assessing the recall of any sentence, we decide whether the subject has chosen the correct referent, and whether he has said the right thing about that referent.

In practice, the scheme normally amounted to awarding a mark to the Subject of a sentence, and a mark to the Predicate (not always, since the grammatical subject is not always the referent of a sentence). For example, given the opening sentence of Passage 6,

During the summer months the Eskimos live a pleasant life.

/one

one mark can initially be assigned to the subject 'The Eskimos' and one mark to 'lead a pleasant life during the summer months'.

Marks were awarded only if a correct predicate was assigned to the correct subject. For example, the subject who recalled the above sentence as:

'The Eskimos live in Wolverhampton during the summer months'.

would get no marks for recalling 'The Eskimos' correctly. It might be argued that this being the case, there was no need to allocate separate marks. However this was in fact necessary since it was possible for a subject to supply a subject or predicate which was not awarded a mark but which was not in fact wrong. Suppose, for example, a subject was attempting to recall the following sentence from Text 5:

> Munningford .... first reported spotting them (Lopsongs) in the far north of Nepal early in 1873.

and produced instead:

> Munningford was in Nepal early in 1873.

He would get no marks for the main part of the predicate. On the other hand, it is not factually wrong, and can, in fact, be deduced from the text. So he would get one mark for the subject.

This was the basic scheme. A short account of the details follows:

1. Coordinate sentences were treated as being two sentences, each with a subject and predicate. This held even when the subject of the second clause had been deleted. For example:

'Facts about Jews are not well-known and are worth summarizing.'

/was

was awarded the following marks:

Facts about Jews (1) are not well-known (1)

Facts about Jews (1) are worth summarizing. (1)

2. Subjects or predicates which were particularly long were often broken up into smaller segments. This applied particularly to adverbial clauses. Thus:

A very large number of errors (1) are made (1)

when this is put to the test.(1)

The marking scheme was normally worked out for the 'A' version of each pair. Then the number of marks which had been arrived at for a sentence were allocated to the corresponding sentence of the 'B' version. Thus sentence 2 of Text 5A was allotted five marks according to the procedures described above. There were thus 5 marks to divide among the sub-units of sentence 2, 5B, and this was done, as far as possible, according to the same principles.

An attempt was made to keep the number of marks allocated to each sentence proportional to the length of the sentence, and a proportion of 1 mark to every 5 words was roughly observed.

7.3.1.4. Subjects: The tests were carried out with 3rd year pupils of three Edinburgh schools, Forrester, St Augustine's, and Craigmount, in late November and early December, 1973. In each school, two classes were selected, one from the top end of the 'O' stream (classes going on to do 'O' grade examinations) and one from near the bottom. The classes were as follows:

Forrester 3E (i) and 3E (xi)

/St Augustine's

St Augustine's 3 (i) and 3 (v)

Craigmount 3G and 3L (ii)

At St Augustine's and Craigmount, the streaming had been done with reference to English, at Forrester with reference to English and Mathematics.

In each school, both classes were allowed the same time to complete the tests, and can be treated as one group. There were thus in all three groups of subjects. Each group read two texts. Craigmount pupils read Texts 2 and 4, St Augustine's Texts 3 and 5, and Forrester's 1 and 6.

Subjects at each school were divided into two experimental groups. At St Augustine's and at Craigmount, this was done by arranging subjects into matched pairs, on the basis of marks either from a second year English exam, (at St Augustine's) or from a series of English tests done that term (Craigmount). At Forrester, prior grouping into matched pairs was not possible, and therefore subjects were assigned to groups by random selection. At Craigmount there were 25 matched pairs, at St Augustine's there were 23, while at Forrester, there were in all 51 subjects, with 27 in one randomly selected group and 24 in the other.

7.3.1.5. Procedure: The tests were administered in the following order:

1. 1st Intrusive Word Test. 2. 2nd Intrusive Test.

3. First Recall. 4. Second Recall.

As a further attempt at randomization, in each case one group did the 'A' version of the first test, and the 'B' version of the second. Thus, for example, one group at Forrester did the following tests:

1A (Intrusive) 6B (Intrusive) 1A (Recall) 6B (Recall).

/Subjects

Subjects had the procedure explained to them before the first Intrusive Test and completed a short practice test. In the case of the Recall Tests, they had explained to them before the reading time, what they were expected to do, and the fact that they could use their own words if they were unable to produce verbatim recall. They were allowed 2 minutes to do the Intrusive Tests (2½ minutes in the case of Text 5, which is longer than the rest), and for the Recall Tests, 2 minutes' reading time and between 7 and 9 minutes' writing time. Virtually everyone appeared to finish the writing part.

7.3.2. Results: Mean scores for each test are given below in Table 7. Actual scores are presented in Appendix 2.

Table 7

	Passage:	1	2	3	4	5	6
(i) Intrusive Word Scores:	'A' Text:	14.0	13.8	15.6	12.9	16.0	17.4
	'B' Text:	16.7	12.8	14.2	12.4	17.0	17.7
(ii) Recall Scores.	'A' Text:	13.3	17.2	13.7	15.2	14.4	17.0
	'B' Text	14.8	20.8	14.0	14.5	21.2	18.7

In the case of the Intrusive scores, none of the differences in means reaches significance. Thus the Intrusive Word Test failed to detect any difference in readability between the 'A' and the 'B' texts. In the case of the Recall scores, the scores for the 'B' versions of Passages 2 and 5 are significantly higher than scores for the 'A' versions.[1] Thus it appears that the paratactic versions of Passages 2 and 5 were easier to recall than the hypotactic versions. None of the other differences in

1. In the case of ~~passg~~ Passage 2, T = 51, for Passage 5, T = 43.

/Recall

Recall scores reaches significance.

7.3.3. Discussion: Significant results were obtained from only two out of the six pairs of texts. There are two ways in which these results can be explained. Firstly, it might be argued that the hypothesis was incorrect, that the distinction between Hypotactic as opposed to Paratactic structures is of no value in predicting the readability of a text, and that the significant difference detected in two cases between 'A' and 'B' texts was the result of some other factor, or factors. Secondly, it might be the case that the hypothesis was correct, and that all the 'B' texts were easier than the 'A' texts, but that the tests were not sensitive enough to allow the difference to reach significance levels in more than two cases. These two possibilities will now be discussed.

7.3.3.1. 1st Possibility: Initial Hypotheses Incorrect. If we are to look for other factors to account for the results obtained, an obvious area of investigation is the system of scoring used for the Recall scripts. The system can be queried on the grounds of lack of either objectivity or validity, or both. These questions will be discussed separately.

7.3.3.1.1. Objectivity: Twenty-four scripts of Text 5 were scored by an independent marker. The correlation between scores awarded by the 1st and 2nd marker was .99.

The Recall scripts of Texts 2, 4, and 5 were re-scored by the experimenter after an interval of one month. The correlation between the 2nd set of scores and the 1st were respectively .97, .92 and .97. It appears that objectivity in applying the scoring schemes was not

/difficult

difficult to attain.

7.3.3.1.2. Validity: It will be remembered that the scoring system involved dividing each sentence into sub-units. Then a sub-unit of one member of a pair of texts was treated as being equivalent in difficulty to the corresponding sub-unit in the other text. This assumed equivalence cannot always be justified. The 'referent' in one sub-unit might be represented by a complex noun phrase, while in the corresponding sub-unit it might consist of a pronoun, recoverable from the rest of the text. It was hoped that on the whole such inequalities would balance out, but this may not have happened.

This difficulty in sub-dividing texts is similar in some ways to the problem discussed by Levitt (1956) with reference to the 'Retained Numbers' method of scoring verbatim recall. The method normally consists of dividing a text into 'Idea Groups' and scoring the recall of each group. Levitt points out that the division is carried out in an arbitrary way, and that two differing divisions of a text can result in different recall scores being awarded. Levitt showed experimentally that the longer a text, the bigger the 'Idea Groups' that subjects divided it into, and that recall scores were in inverse proportion to the number of words in the groups. As a solution to this problem, he suggests using 'grammatical idea groups'. This, however, may not result in much improvement, firstly because it appears likely that the original Idea Groups were based intuitively on grammatical constituents, secondly because the boundaries of such constituents may not be as determinate and objectively recognizable as might have appeared at the time Levitt was writing.

/In

In the marking scheme used here, each pair of texts to be compared was divided into the same number of sub-units, so that Levitt's criticisms of Idea Groups is not strictly relevant. Nevertheless it is true that the division of texts into scoring units was done in a fairly ad hoc way, and that this may have affected the scores.

7.3.3.1.3. Redundancy: A scoring problem which a reliance on grammatically bsed units would fail to solve is brought about by textual redundancy. This is caused by a variety of factors. For example, let us examine a sentence from Text 2B,

'The first live specimen of the animal was captured ...'

Given the position of the sentence in the text, the phrase 'of the animal' is redundant. Moreover, the word 'live' appears to be redundant as well, since we do not normally talk about 'capturing' dead animals. A subject who recalled this segment as,

'A Lopsong was first captured ...'

would have to be given the appropriate marks, although he has reduced the 9 words of the original to 5. Sometimes the presence of such redundancy in one member of a pair but not the other may have affected scores. For example, in the marking scheme for Text 2A, unit 27,

'even if he was correct'

had as its equivalent unit in Text 2B the phrase,

'at the time'.

However, this latter phrase is textually redundant. If the subject leaves it out in his recall script, that script will still usually mean

/the

the same as the original. The same is not the case for the unit of 2A. So if a subject leaves it out, he will lose a mark. Thus in this case, 2A would seem to be more difficult to recall than 2B.

A certain amount of this is due to bad writing when composing the texts. It seems likely that the attempt to construct sentences for the 'B' texts which were the same length as those of the already existing 'A' texts resulted in the 'B' texts containing a certain amount of redundant 'padding'. Such is the variety of sources of redundancy, however, that it seems almost impossible to control entirely for it. One must either hope that redundancies cancel each other out, or fall back on verbatim marking.

7.3.3.1.4. Facility Ratings of Items: Another possibility that may have affected the scores is that the differences between the texts for which significant results were obtained were the result of a small number of items. If, for example, the facility ratings for the units of 2B were equal to those of 2A, with the exception of, say, four units, but in the 'B' text, the facility rating for these four units was 100%, whereas in the 'A' text, it was 0%, then this would have produced something like the results that were obtained. If, moreover, the difficulty of the four units in the 'A' text could be shown to be unconnected with the experimental variable, then this would be strong evidence for dismissing the hypothesis.

To check this possibility, an item analysis was carried out on the recall answers to Texts 2A and 2B, and 5A and 5B. When the facility ratings of Text 2A were compared to those of 2B, the following findings emerged. Out of 34 items, the facility ratings for items in the 'A'

/text

text were higher in 12 cases, as opposed to 21 items in the 'B' text with higher ratings. If one counts only those items for which the difference was 15% or more, then 6 items in the 'A' text were easier than the equivalent items in the 'B' text, as opposed to 12 items in the 'B' text that were easier.

For Texts 5A and 5B, the figures were as follows:

Out of 32 items, the facility ratings of units of the 'B' text were higher in 23 cases. Those of the units of the 'A' text were higher in 9 cases. If only those cases in which the difference was 15% or more are counted, then 13 'B' text items were easier, as opposed to 4 'A' text items. Thus there does not seem to be much support for the suggestion that the results were produced by a very small number of items.

In Appendix 4 are listed those items whose ratings differed by a major amount, together with possible explanations. These explanations ignore any difference imparted by the overall structural difference between 'A' and 'B' texts. Leaving this out, there does not appear to be any common explanation for the difference in facility ratings.

7.3.3.2. 2nd Possibility: Hypothesis Correct. If we assume that the initial hypothesis was correct, then we are faced with the problem of why only two out of six paratactic texts proved easier to recall than the corresponding hypotactic texts. One possibility is that all the 'B' texts were easier than the corresponding 'A' texts, but that the free recall test was not sufficiently sensitive to detect the difference in more than two cases.

/Another

Another possibility arises from the fact that the scoring schemes for the recall tests took account only of statements and not relationships. If relationships were lost in the course of recall, this loss would not be detected in the scoring. It seems likely that hypotactic relationships may be lost either during comprehension or during the recall process. That is, the text,

'The woodpecker is an unusual bird. It bores holes in trees.'

may be understood or recalled as,

'The woodpecker is an unusual bird and it bores holes in trees.'

Since hypotactic relationships need not be made overt, this 'degeneration' of a hypotactic text into a paratactic one would not be detected. If the hypotactic texts were read as if they were paratactic texts, then this would explain why in four cases, there was no significant difference between recall of 'A' and 'B' texts. Hypotactic relationships, in other words, will not cause difficulty if they are not noticed. It would then have to be assumed that for some reason, the relationships in Texts 2A and 5A proved more resistent to the process of 'degeneration'.

A possible way to counteract this tendency would be to force subjects to notice the relationships. This might be done by presenting them with a series of questions, possibly before they read the texts for recall purposes, which would be designed to focus the attention of those reading the hypotactic texts on the relationships contained in them. Thus subjects reading the hypotactic version of the 'Woodpecker' text

/might

might be asked the questions,

1. What sort of bird is the woodpecker? (ans.: 'unusual')
2. Why does the writer say this? (ans.: 'because it bores holes in trees')

while those reading the paratactic version might be asked,

1. What sort of bird is the woodpecker? (ans.: 'arboreal')
2. What does the writer say it does? (ans.: 'He says it bores holes in trees').

If the need to grasp hypotactic relationships really did cause difficulties, then the effort caused subjects by having been forced to focus on them might be expected to show in a less successful recall.

7.4. 2nd Experiment: Re-Run of Passages 2 and 5.

7.4.1. Introduction: In the main version of Experiment 3, 6 pairs of texts had been used, but a significant difference had been discovered between members of only 2 pairs, Passage 2, 'A' and 'B', and Passage 5, 'A' and 'B'. In both cases it had been the 'B' version which was easier to recall. It was decided to check this by re-testing just those two pairs of texts, making use of a different method of testing.

7.4.2. Method:

7.4.2.1. Tests: Two types of test were used, as in the original experiment. Cloze procedure was substituted for the Intrusive Word Test, while instead of uncontrolled Free Recall, a method of 'Guided Recall' was employed.

/7.2.2.1.

7.4.2.1.1.Cloze: The standard form was used, every 5th word being deleted and replaced with a gap to be filled in by the subjects. It has been suggested (cf. Pool, 1959: p. 80) that Cloze is hardest when nouns, verbs and adverbs, the so-called 'lexical' items, are deleted, and easiest when articles, conjunctions etc., that is, 'structural' items are deleted. It was thought possible, in the present case, that deleting every 5th word from each member of a pair of texts might result in more 'lexical' items being deleted from one member than from the other, thus affecting the relative difficulty of that member. A count was therefore made of the number of lexical items deleted from each pair of texts. The categorization adopted was that developed in Fries (1952). The results of the count are presented in Table 8 below:

Table 8

	Text 2		Text 5	
	A	B	A	B
Total No. of words deleted:	29	29	33	33
No. of lexical items deleted:	18	15	13	16

It did not seem likely that differences on this scale would affect the results. In marking the Cloze tests, only the insertion of the exact word used in the source was scored as correct.

7.4.2.1.2. Guided Recall: This represented an attempt to exercise more control over recall answers than is possible with Free Recall. Tests were contructed in the following way:

/(i) For

(i) For each member of a pair of texts, a paraphrase was constructed. For example, below is the first part of Passage 2A:

> The Lopsong, or Himalayan muntjak, is an animal with an unusual way of life. It is seldom to be found in the company of its own kind, except during the brief mating season, when small herds are sometimes observed. The mountains on which this rare creature lives are so bare that a territory is seldom able to sustain more than one animal.

This was paraphrased as follows:

> This passage is about a kind of animal. It's called the Lopsong. Another name for it is the Himalayan Muntjak. The author describes its way of life as unusual. It's not often that one finds it in the company of its own kind. An exception to this is during the brief mating season. Then you sometimes see small herds. As far as numbers are concerned, the creature must be considered to be rare. The mountains where this creature lives are very bare. Because of this, a single area can seldom sustain more than one animal.

(ii) Chunks of the above paraphrase were then deleted, and replaced by blanks. The mutilated paraphrase was then set out with each sentence starting a new line. The part of the paraphrase of 2A shown above appeared as follows:

This passage is about a kind of _____
It's called the _____
Another name for it is the _____

/The

The author describes its way of life as _____

It's not often that one finds it _____

An exception to this is _____

Then you sometimes see _____

As far as numbers are concerned, the creature must be considered to be_____

The _____ where this creature lives are very _____

Because of this, a single area can _____

The corresponding section of Text 2B, and the mutilated paraphrase of it were as follows:

> The Lopsong, or Himalayan Muntjak, is an animal with a nomadic way of life. It is seldom to be seen in zoos in this country with the exception of the zoo at Chilling, where three muntjaks can be observed. The hairy coat of this rare creature is so impenetrable that on its home ground it can withstand temperatures well below freezing point.

This passage is about a kind of _____

It's called the _____

Another name for it is the _____

The author describes its way of life as _____

It's not often that one sees it _____

An exception to this is _____

There you can see _____

As far as numbers are concerned, the creature must be considered to be_____

The creature has _____

This is so _____ that the creature

can _____

/The

The other tests are presented in Appendix 1.

As well as guiding recall, it was hoped that the paraphrases would elicit meaningful recall, since the paraphrases are so composed that subjects could not complete them by recalling the original text verbatim.

An attempt was made to ensure that each member of a pair of paraphrases was as similar as possible to the other member. Both had the same number of gaps to be filled. In both, the number of words of cueing material was approximately the same. Whenever this cueing material could be made identical in each member of a pair of paraphrases, this was done. Within the limits it set down, the test required Free Recall, so the number of words that subjects were required to supply could not be calculated exactly. However, had subjects completed the tests using phrasing as close as possible to the original texts, then each member of a pair required approximately the same number of words to be supplied. Details of this are set out in Table 9 below:

Table 9

Paraphrase	No. of words supplied	No. of words to be supplied	Total of blanks
2A	131	70	26
2B	131	71	26
5A	115	89	31
5B	107	89	31

7.4.2.2. Subjects: The experiment was conducted in February, 1974, at Inverness Royal Academy, with 18 matched pairs of subjects drawn from classes 3D and 3E. Matching was done on the basis of marks scored in

/the

the subjects' last English examination. One group did Tests 2A and 5B, and the other 2B and 5A.

7.4.2.3. Procedure: Subjects did the tests in the following order:

1. Passage 2, Cloze Test - Time = 4 minutes.
2. Passage 5, Cloze Test - Time = 4 minutes.
3. Reading of Passage 2, unmutilated text - Time, 1½ minutes.
   Passage 2, Guided Recall Test - Time, 7/8 minutes.
4. Reading of Passage 5, unmutilated text - Time, 1½ minutes.
   Passage 5, Guided Recall Test - Time, 7/8 minutes.

7.4.3. Results: Mean scores are given in Table 10 below: Actual scores are presented in Appendix 1.

Table 10

	2A	2B	5A	5B
Cloze Test:	10.8	14.6	10.8	11.4
Guided Recall Test:	17.2	16.6	12.0	16.3

In the Cloze Test, 2B was significantly easier than 2A, at the 5% level, 2-tailed hypothesis. The difference between 5A and 5B was not significant.

In the Recall Test, 5B was significantly easier than 5A, at the 5% level, 2-tailed hypothesis. The difference between 2A and 2B is not significant.

Thus it appears that 2B was easier to read and comprehend quickly, but no easier to recall than 2A. On the other hand, 5B was apparently

/no

no easier to read and comprehend quickly, but was easier to recall than 5A. I can think of no reason that would explain this apparent difference between 2B and 5B.

7.4.4. Discussion: As far as the results go, they confirm the findings of the main part of the Experiment. In one way or another, Passages 2B and 5B were easier than 2A and 5A.

7.5. 1st Experiment, Re-Run: The results of the second experiment had left some doubts remaining. In particular, Passage 2B had not been shown to be easier to recall than 2A, although this had been one of the significant findings of the original version of the experiment. As a consequence, the two pairs of texts, 2A and 2B, and 5A and 5B, were tested for a third time at Portobello High School, Edinburgh, in late June, 1974. Subjects were 19 matched pairs, drawn from two third-year classes. This version of the experiment reverted to the original form; that is, tests consisted of (i) an Intrusive Word Test (ii) a Free Recall Test. The tests, and procedure associated with them, were the same as in the original experiment. Mean scores are summarized in Table 11 below: Actual scores are presented in Appendix 2.

Table 11

	2A	2B	5A	5B
Intrusive Word Test:	20.1	19.4	22.3	20.4
Free Recall Test:	19.2	21.5	18.	18.0

None of the differences between means is significant.

/Conclusion

7.6. Conclusion.

In the first experiment, Texts 2B and 5B were significantly easier to recall than 2A and 5A. In the second experiment, 2B was significantly easier than 2A in a Cloze test, and 5B was significantly easier than 5A in a Guided Recall test. In the re-run of the first experiment, no significant difference was found between either 2B and 2A or 5B and 5A, in either an Intrusive Word Test or a Free Recall Test. This final result is disappointing since the re-run of the experiment was a duplication of those parts of the first experiment in which significant results had been obtained.

It may well be the case that it is simply not practicable to compare free recall of a pair of texts which contain different information. Such a comparison involves one in an attempt to divide each member of the pair into a number of 'units of information', with one member of the pair containing different units of information from the other. This is necessary because, while it is possible to compose a marking scheme based on grammatical constituents in the texts, it is not possible to draw a one-to-one correspondence between information and grammatical constituents. Hence a subject may recall the information accurately without making use of the original grammatical constituent.

There is, however, no really objective way of defining 'units of information', and it seems likely that the attempt to assess recall by using such units was to leave too many factors, such as grammatical complexity, textual redundancy, etc. uncontrolled.

One is thus thrown back on more 'objective' methods of testing, such as Cloze Procedure and Intrusive Word tests. The Intrusive Word

/test

test detected no significant differences between the 'A' and 'B' versions of any of the 6 texts. Cloze Procedure detected a difference between Texts 2A and 2B, but was not tried in the case of Texts 1, 3, 4 and 6. This was perhaps unfortunate, but even had it been tried, and significant differences detected, it could be argued that the differences were the result, not of the difference in rhetorical structure of the texts, but of the 'availability' of the information contained in each.

It might be worthwhile to compare a large number of pairs of two-sentence texts, such as the two versions of the 'Woodpecker' text, since in the case of such short texts, it is possible to keep the overt differences between each member of a pair down to the minimum. Since the interest here was in the structure of longer texts, however, such an attempt was not made.

CHAPTER 8

LOGICAL PRINCIPLES

MARKED v UNMARKED HYPOTACTIC TEXTS

8.1. Introduction: The inter-sentential hypotactic relationships discussed in Chapter 6 are signalled primarily by the relative sequential position of the sentences, and optionally by connectives such as 'for example', 'because', 'in that', etc. The fact that such connectives are optional makes it possible to use marking as an experimental variable in an experiment testing the comparative readability of two versions of a text. The two versions can be identical, or near identical with respect to the factual information they contain and the order in which it is presented, and differ in that one is marked and the other is unmarked. The hypothesis will then be that since in the marked text, the relationships are made explicit, such texts will be more easily understood than corresponding unmarked texts.

It is probably the case that in written English, at least, hypotactic relationships are more often implicit than explicit. Winter has suggested that they are left implicit in 80% of cases (Winter, 1971). He found that markers, which he calls 'sentence adjuncts', were commoner in university text-books than in either technical journals or popular scientific journals and suggests that this is because teaching books try to make the relationships as explicit as possible (Winter, 1968). The difficulty that unmarked relationships may cause to an uninformed learner has already been mentioned in Chapter 6.

/E. V. Katz

E. V. Katz and S. B. Brent (1968) investigated the use of connectives like 'because', 'when', 'therefore' etc. with three groups of students, one group aged 6/7 years, the second aged 11/12 years and the third group composed of college students. They examined subjects' use of connectives in spontaneous utterances, their selection of the 'best' pairing of sentences (eg. marked or unmarked pairing, 'when' v 'because' etc.), and subjects' ability to explain relationships. Not surprisingly, the older groups were able to explain their usage better than the youngest group, but this is not a normal language requirement, and is irrelevant here.

Katz and Brent found that subjects used explicit connectives to mark causality, the only ones who left the relationship unmarked being in the youngest group. All the groups preferred the sentence,

'We didn't sit down because the bench was wet.'

in preference to

'We didn't sit down, the bench was wet.'.

The Katz and Brent experiment can be viewed as providing a limited amount of evidence that subjects, including children, prefer explicit marking of causal relationships to implicit relationships. This is odd in the light of Winter's findings that the implicit forms were far more common in adult written use. Possibly relations of causality are marked more frequently than other relationships. Possibly the subjects preferred the relationships in restricted, 2-sentence texts to be marked, whereas in more extended texts there would be more contextual clues and hence less need for marking. It is also possible that implicit forms are more common in the written language than in the

/spoken

spoken language, from which Katz and Brent collected their spontaneous data.

8.2. Common Markers of Hypotactic Relations: The following is not intended as a systematic survey, but merely as a sketch to illustrate relationship markers commonly found in the kind of text used in the experiment. Most of the examples are taken from 'real' texts, though some have been shortened. Detailed references are not given, but the type of text from which the example has been taken is indicated.

8.2.1. Statement and Explanation: Between clauses, the common markers are,

'because', 'since', 'as', 'for'(?).

There is also the V + ing construction,

'Having spent all our money on wine, we couldn't go out to eat.'

Curme points out that cause 'sometimes finds expression in an attributive element, either in the form of an attributive adjective or an attributive relative clause: "The cruel man didn't pay any attention to their pleadings" = since he was cruel.' (Curme, 1931: p. 312). Since, however we are focussing on statements, this is best treated as an interesting side-issue. Jespersen points out that reasons are 'often indicated by a subsequent sentence containing so or such' and cites examples like,

'She could hardly speak, she was so excited.'

He adds that 'for' is inserted to indicate the reason more explicitly

/Jespersen

(Jespersen, 1961: p. 387).

Between sentences, a common marker is 'This is because':

> 'Camels can travel long distances without water. This is because they have special cells in their stomachs which store water.' (Text-book).

Other possibilities are 'The reason for this is that', 'This is due to the fact that', 'This is a result of the fact that' etc. The fact that in the example above, the marker 'This is caused by the fact that' seems inappropriate suggests that the language recognizes different kinds of causal relationships.

8.2.2. Assertion + Substantiation: By far the most common occurrence appears to be the implicit form, eg.

> 'This convenient technique is highly inefficient. In normal practice it is unusual for more than about 40% of the nitrogen to reach the plants.' (Newspaper)

Apart from this, this relationship shares with the previous one the inter-clause markers, 'because', 'since', 'as', and more definitely this time, 'for':

> 'The main bacterium involved is highly unusual, for its life cycle includes phases during which it becomes extremely long and thin.' (Newspaper article).

John Ross (1970) cites the example,

> 'Jenny isn't here, for I don't see her.'

as an instance of a for-clause providing a reason for the speaker to

/assert

assert the first statement. Curme, in fact, appears to regard 'for' as confined to this relationship:

"'For' also differs from as and since in that it can introduce an explanation that does not contain the idea of cause. 'It is morning, for the birds are singing.'" (Curme, 1931: p. 315). While there does seem to be a tendency to keep 'for' confined to substantiation, it is difficult to agree with Curme that in a sentence such as the one he quotes, 'since' or 'as' are unacceptable.

The most unambiguous marker of substantiation appears to be 'in that':

'This crossword puzzle is quite different from the normal kind in that there are no clues.' (Newspaper article)

'It might be answered that such over-informativeness may be confusing in that it is liable to raise side issues.' (Academic article)

'Crystals are almost alive, in that they grow by reproducing themselves.' (Popular science book)

Apart from this, we could probably find examples of the use of 'in so far as' and 'in as much as'. The use of colons is favoured by some writers:

'The dark skin of a Negro is not due to the direct effects of the sun: Negros have the capacity to form melanin in their skin without exposure to the sun.' (Popular science book)

Between sentences, again absence of marking is the rule. One very occasionally finds 'for':

/'The

'The distribution of the chips in the Stonehenge layer does not favour this theory of their origin. For the dressing of stones within the Stonehenge earthwork would produce a number of isolated chips.' (Popular science book).

Very explicit spellings out of the speech act would be 'I say this because', 'My reason for saying this is that' etc.

8.2.3. Exemplification: There are two unambiguous markers, 'for example' and 'for instance':

'They are also superior in aesthetic sense: for instance, they discriminate colours better than boys.' (Popular science book).

The implicit form appears once again to be very common.

8.2.4. Concessions: A concession, as defined in Chapter 6, is a part of a larger structure, 'Assertion + Concession + Substantiation'. Just as the relationship 'Assertion + Substantiation' is often found in an unmarked form, so often is there no explicit marking of a concession in relation to an Assertion. What is always marked, however, is the contrastive relationship between a Concession and a Substantiation. This obligatory contrast is marked in one of various ways,

'but', 'yet', 'still', 'however', 'nonetheless', 'nevertheless', 'In spite of this', 'Despite this', 'although'.

The marking of the Concession in relation to the Assertion may be done in one of the following ways:

(i) Certainly: 'Certainly the two men were implicated in the plot against the king.' (Newspaper article).

/(ii)

(ii) Granted: 'Granted, environmental agencies can interfere with the development of sex characteristics.' (Popular science book)

(iii) To be sure: 'To be sure, New England had no aristocracy, and the monarchical power was far away and usually quite ineffective.' (History book)

(iv) True: 'True, Britain did interfere in 1964 in Kenya, Uganda and Tanzania.' (Newspaper article)

(v) Admittedly: 'Admittedly at all these points the line of the axis can be estimated to an inch or two either way, and most people would think this good enough.' (Popular science book)

(vi) Use of 'May', 'might' and emphatic forms of the verb: 'The previous Labour Government did back away from 'In Place of Strife' under union pressure.' (Newspaper article).

Very explicit spellings out of the Speech Act would be 'I admit that', 'It must be admitted that' etc.

8.2.5. Reversals: Sometimes the relative order of the sentences in the relationship can be switched without appearing to alter the meaning very much. For example, given the two texts,

(i) He fell off the pier. He drowned.

and

(ii) He drowned. He fell off the pier.

we would probably agree that both contain the information that, firstly,

/'He

'He fell off the pier', secondly, 'He drowned', and thirdly, his drowning was the result of his falling. Markers of the 'Cause + Effect' relationship are 'so', 'hence', 'thus', 'in consequence', 'as a result (of this) etc.

The relationship 'Assertion + Substantiation' can be reversed, again sharing most of its markers with the equivalent reversed causal relationship:

> 'There are no clues in this crossword puzzle. Thus it is quite different from the normal kind.'

There even appears to be a direct equivalent to 'in that', namely 'In this', a difference being that the latter marker is restricted to relations between independent sentences:

> 'Crystals grow by reproducing themselves. In this they are almost alive.' (Popular Science Book).

When the sentences forming an 'Assertion + Example' relationship are reversed, we get what appears to be functionally a very different kind of relationship:

> 'Saith may be called coal fish, coley, and a whole host of local names from cooth to prinkle. Fish often have their own local names.'

A likely connective is 'in fact', and the second statement appears to be an almost parenthetical generalization of the first.

Finally, as far as Concessions are concerned, the Concession element cannot be switched to a position after the Substantiation, without materially altering the effect of the text. The following

/text,

text, for example, with the Concession in the normal position, appears to be an argument in favour of buying a house:

> 'This house is almost ideal for us. It's a bit far from your work, but the state rooms are delightful.'

whereas the text with the concession moved to the end,

> 'This house is almost ideal for us. The state rooms are delightful: but it's a bit far from your work.'

seems to be weighted against the proposal.

8.3. 1st Experiment.

8.3.1. Method.

8.3.1.1. Preparation of Texts: Four Primary Passages were selected, the main criterion for selection being that each passage should contain inter-sentential relationships of the types that have been discussed. These passages were then abridged, simplified, and altered in any other way thought necessary to form the Pre-Experimental Passages. Each of these was supplied with a title, for use in the experiment. These titles were not part of the original Primary Passages. For convenience of reference, in the Pre-Experimental Passages given below, each sentence has been numbered.

1. 'Black and White' (Adapted from an article in 'The Guardian'.)

> 1. A primary school teacher in London held an election in class to show the pupils how such things work. 2. The children in the class - thirty black and four white - sat down with much

/pencil

pencil chewing to elect a Prime Minister, Foreign Secretary, and Home Secretary. 3. When the teacher realized how things were going, she was appalled. 4. The three representatives elected were all of them white. 5. And they must have been elected purely because of their whiteness: none of them were in any way natural leaders. 6. It's a striking story, because this class, in racial terms, was a good class. 7. There was little insecurity, little feeling among the black children that they had to fit into a white framework. 8. Right from the very beginning they painted themselves and their families brown or black in their drawings. 9. Yet when it came down to picking out those most suited for authority, they chose the whites.

2. 'Political Candidate' (Adapted from an editorial in 'The Scotsman')

1. We must conclude that in selecting McRule to run for President the Populist Party have this year chosen the wrong man. 2. McRule is far too radical for a country that would dearly like a period of peace and quiet. 3. But apart from that, he has not shown himself ideally suited to the exacting demands of the Presidency. 4. His conduct over the vice-residential candidacy of Senator Hawkham was ill-judged and inconsistent. 5. On the war in Ranasthan his policy is tantamount to simple surrender. 6. He has failed to take the initiative in the campaign itself. 7. But Mullin has by no means been an ideal President either. 8. It must be counted to his credit that he has almost ended Wallachian involvement in the Ranasthan war, but in other areas of

/policy

policy he has concentrated on the popular and spectacular rather than on the unpopular but sound. 9. Nevertheless McRule's failings will probably cost him the election.

3. 'Arms Reduction' (Adapted from an editorial in 'The Scotsman')

1. Mr Gromyko, the Soviet Foreign Minister, has proposed that international expenditure on defence should be cut by ten per cent and part of the saving used to assist the poorer nations. 2. Certainly the Soviet Union could manage a ten per cent cut since it spends far more on its armed forces in Europe than is required for defensive purposes. 3. There is, of course, some difficulty in calculating exactly what the Soviet Union does spend on defence, since it tends to underestimate, or disguise the total sum. 4. However, it has been estimated that it spends around eleven per cent of its gross national product on defence. 5. From the Soviet point of view, this is a good year in which to make the proposal, since the previous arms build-up has been both excessive and expensive, and China is still far behind. 6. Still, the Soviet Government's desire for an arms reduction deserves to be investigated.

4. 'Crime Statistics' (Adapted from 'The Human Species', by A. Barnett, p. 172)

1. Statistics of crime are very difficult to interpret. 2. This is clearly shown by the difficulties met with in the United States, with its mixed population. 3. Suppose, for example, that we compare the Irish and the Italians in America. 4. We can hardly hope to learn about the criminal tendencies of the Irish and the

/Italians

Italians in general: the immigrants from the two countries may constitute two quite unrepresentative groups: the best types of Italian might be reaching American and the worst Irish, or vice versa. 5. On the other hand, it's no use comparing the figures for the Irish in Ireland with those for the Italians in Italy: the comparison would be spoiled by differences in laws in the two countries. 6. Even in a single country, different groups may be tr^ated differently. 7. It is a commonplace that Negros in the United States (and especially in the south) are more likely to be convicted, than whites.

8.3.1.1.1. Analysis of Relationships: Below is a brief account of the relevant relationships in the Pre-Experimental Passages. The following abbreviations are used: S1 = Sentence 1 of the text; S1 - S2 = there is a relationship between the first and second sentences of the text; $S2_1$ = Sentence 2, 1st part (used when the relationship in question is between 2 clauses of a single orthographic sentence).

Passage 1:

(i) S3 -S4 Causal relationship: 'The fact that they were all white caused her to be appalled'.

(ii) $S5_1$ - $S5_2$ Substantiation: 'The fact that none of the children were natural leaders caused/ entitled the teacher (?) to conclude that they had been elected because of their whiteness'.

(iii) $S6_1$ - $S6_2$ Substantiation: 'It's a striking story in that it was a good class'.

/(iv)

(iv) S7 - S8 Exemplification: 'Painting themselves brown is an example of the children's lack of a sense of insecurity'.

Passage 2:

(i) S1 - S2 Substantiation: 'He's the wrong man in that he's too radical.'

(ii) S1 - S3 Substantiation: 'He's the wrong man in that he's shown himself unsuited ..'

(iii) S3 - S4 Exemplification/ Substantiation: 'His conduct over the vice-Presidential candidacy is an example of his being unsuited ..'

(iv) S3 - S5 " " " "

(v) S3 - S6 " " " "

(vi) S6 - S7 Concession: 'He's done at least one thing which counts in his favour as President.'

(vii) S7 - S8 Substantiation: 'He's not ideal in that his policy is spectacular rather than sound.'

Passage 3:

(i) $S2_1$ - $S2_2$ Substantiation: 'My reason for thinking they could manage a cut is that they spend more on defence than is necessary.'

(ii) $S3_1$ - $S3_2$ Substantiation: 'The expenditure is difficult to calculate in that they underestimate it.'

(iii) $S5_1$ - $S5_2$ Substantiation: 'It's a good year in that the arms build-up has been excessive etc.'

Passage 4:

(i) $S4_1$ - $S4_2$ Substantiation: 'My reason for denying that we can

/learn

learn is that the immigrant groups may be unrepresentative.'

(ii) $S4_2$ - $S4_3$ Exemplification/ Substantiation: Either 'Examples of such groups would be the best Italians and the worst Irish.'

or

'The groups may be unrepresentative in that the best Italians may be reaching the U.S.A.'

(iii) $S5_1$ - $S5_2$ Substantiation: 'It's useless to compare the figures in that the comparison is spoilt by differences in laws.'

(iv) S6 - S7 Exemplification: 'Negros in the U.S.A. are an example of a group in a single country being treated differently.'

There is also the rather more complex instance of the relationship (of exemplification) between S1 and S2 on the one hand, and S3 and S4 on the other. This is more easily seen if we paraphrase the text as,

'In the U.S.A., with its mixed population, statistics of crime are very difficult to interpret. For example, if we compare the Irish and Italian immigrants, we can't generalize, since .....etc'.

8.3.1.1.2. Markers Used in the Pre-Experimental Passages:

Passage 1. 'because', Sentence 6. There are 3 implicit relationships. (It might be argued that the colon in S5 is a marker. I doubt, however, if it is sufficiently unambiguous to count as an explicit marker.)

Passage 2. 'it must be counted to his credit ...' Sentence 8. There are 6 implicit relationships.

/Passage 3.

Passage 3. 'since', Sentence 2.

'since', Sentence 3.

'since', Sentence 5. No implicit relationships.

Passage 4. 'for example', Sentence 3. There are 4 implicit relationships. Colons occur on three occasions (see above).

There are thus in all some 19 relationships, of which 6 are marked. That is, about 70% of the relationships are implicit. This agrees roughly with Winter's estimate (Winter, 1971).

8.3.1.1.3. Construction of Experimental Passages: For the marked ('A') texts, this involved making explicit relationships that had been left implicit in the Pre-Experimental Passages. The following markers were inserted, in some cases with appropriate changes in punctuation:

Passage 1. between S3 & S4, 'The reason was that'

between $S5_1$ & $S5_2$, 'for'

" $S6_2$ & S7, 'I say this because'

" S7 & S8, 'For example'

Passage 2: between S1 & S2, 'One reason for saying this is that'

" S3 & S4, 'For instance'

" S3 & S5, 'And'

" S3 & S6, 'Moreover' (Both this marker and the previous one showing that the sentences they precede are examples.)

" S7 & S8, 'We admit that' (Replaces the original marking)

Passage 3: between $S2_1$ & $S2_2$, 'The reason is that' (Replaces the

/original

marker)

between $S3_1$ & $S3_2$, 'This is because' (Replaces the original marker)

" $S5_1$ & $S5_2$, 'This is the case because' (" ")

Passage 4: between $S4_1$ & $S4_2$, 'This is because'

" $S4_2$ & $S4_3$, 'For instance'

" $S5_1$ & $S5_2$, 'This is because'

" S6 & S7, 'For example'

The 'A' (marked) group of texts were then as follows (markers are underlined):

1A

A primary schbol teacher in London held an election in class to show the pupils how such things work. The children in the class - thirty black and four white - sat down with much pencil chewing to elect a Prime Minister, Foreign Secretary, and Home Secretary. When the teacher realized how things were going, she was appalled. The reason was that the three representatives elected were all of them white. And they must have been elected purely because of their whiteness: for none of them were in any way natural leaders. It's a striking story, because this class, in racial terms, was a good class. I say this because there was little insecurity, little feeling among the black children that they had to fit into a white framework. For example, right from the beginning they painted themselves and their families brown or black in their drawings. Yet when it came down to picking out those most suited for authority, they chose the whites.

/2A.

2A

We must conclude that in selecting McRule to run for President the Populist Party have this year chosen the wrong man. One reason for saying this is that McRule is far too radical for a country that would dearly like a period of peace and quiet. But apart from that, he has not shown himself ideally suited to the exacting demands of the Presidency. For instance, his conduct over the vice-presidential candidacy of Senator Hawkham was ill-judged and inconsistent. And on the war in Ranasthan his policy is tantamount to simple surrender. Moreover he has failed to take the initiative in the campaign itself. But Nullin has by no means been an ideal President either. We admit that it is to his credit that he has almost ended Wallachian involvement in the Ranasthan war, but in other areas of policy he has concentrated on the popular and spectacular rather than on the unpopular but sound. Nevertheless McRule's failings will probably cost him the election.

3A

Mr Gromyko, the Soviet Foreign Minister, has proposed that international expenditure on defence should be cut by ten per cent and part of the saving used to assist the poorer nations. Certainly the Soviet Union could manage a ten per cent cut. The reason is that it spends far more on its armed forces in Europe than is required for defensive purposes. There is, of course, some difficulty in calculating exactly what the Soviet Union does spend on defence. This is because it tends to underestimate, or disguise the total sum.

/However,

However, it has been estimated that it spends around eleven per cent of its gross national product on defence. From the Soviet point of view, this is a good year in which to make the proposal. This is the case because the previous arms build-up has been both excessive and expensive, and China is still far behind. Still, the Soviet Government's desire for an arms reduction deserves to be investigated.

4A

Statistics of crime are very difficult to interpret. This is clearly shown by the difficulties met with in the United States, with its mixed population. For example, suppose that we compare the Irish and the Italians in America. We can hardly hope to learn about the criminal tendencies of the Irish and the Italians in general. This is because the immigrants from the two countries may constitute two quote unrepresentative groups. For instance, the best types of Italian might be reaching American, and the worst Irish, or vice versa. On the other hand, it's no use comparing the figures for the Irish in Ireland with those for the Italians in Italy. This is because the comparison would be spoiled by differences in laws in the two countries. Even in a single country, different groups may be treated differently. For example, it is a commonplace that Negroes in the United States (and especially in the south) are more likely to be arrested for criminal offences, and, once arrested, more likely to be convicted, than whites.

The 'B' (unmarked) group of texts was then constructed by deleting

/any

any markers that existed in the Pre-Experimental Passages, and making such alterations in punctuation as seemed necessary. One result of adding markers to the 'A' texts and deleting them from the 'B' texts was to make the 'B' texts shorter. They were brought up to the same length, in number of words, as the 'A' texts by the addition to each text of a final sentence. This was kept as uninformative as possible, so as not to force subjects reading the texts to handle more material than subjects reading the 'A' texts, and usually took the form of a rhetorical question. Text 1B is given here as an example. The other 'B' texts are presented in Appendix 5.

1B

A primary school teacher in London held an election in class to show the pupils how such things work. The children in the class - thirty black and four white - sat down with much pencil chewing to elect a Prime Minister, Foreign Secretary, and Home Secretary. When the teacher realized how things were going, she was appalled. The three representatives elected were all of them white. And they must have been elected purely because of their whiteness: none of them were in any way natural leaders. It's a striking story: this class, in racial terms, is a good class. There was little insecurity, little feeling among the black children that they had to fit into a white framework. Right from the very beginning they painted themselves and their families brown or black in their drawings. Yet when it came down to picking out those most suited for authority, they chose the whites. What do you do in order to prevent this sort of situation?

8.3.1.2. Tests:

(i) As in most of the previous experiments, an Intrusive Word Test was used as a measure of subjects' speed and comprehension. Details of these tests are given in Appendix 1. When the intrusive words were being inserted into the 'A' (marked) texts, the markers in these texts were not taken into account; that is, the intrusive words were inserted at random intervals calculated in such a way as to ignore the presence of the markers. There were two reasons for this. Firstly, since with the exception of the markers and the additional final sentences of the 'B' texts, ignoring the markers in the insertion of the words meant that these intrusive words occurred at the same points (ie. between the same original words) in each member of a pair. No words were inserted in the final sentences of the 'B' texts.

Secondly, since it was hoped that the markers would clarify the organization of the text, and possibly aid prediction, and hence increase speed of reading, it was thought undesirable to have them obscured, as might have happened if intrusive words had been inserted between the words making up a marker.

(ii) An innovation in this experiment was the use of open-ended questions. These had to be read by subjects before they commenced the Intrusive Word Test, and completed, without the text being consulted, immediately on subjects' being told to stop the Intrusive test.

At this stage of the experiment the function of these questions was not to form an additional test of comprehension. Rather it was

/to

to focus the subjects' attention on inter-sentential relationships. It had previously been suspected that the Intrusive Word Test was being answered by reference to clues in the immediate vicinity of the intrusive word, and hence tested intra-sentence grammar. It was hoped that asking subjects questions relating to inter-sentential relationships before they read the text might motivate them to look for these relationships as they read. Then, if marking facilitated recognition of the relationships, the marked texts would give less difficulty than unmarked texts, and hence the Intrusive Word scores for marked texts should be higher.

The Open-Ended Questions for Passage 1 are presented below. The others can be found in Appendix 1. It can be seen that each question is directed at some inter-sentential relationship.

Passage 1: 'Black and White'.

(i) Why was the teacher appalled by the results of the experiment?

(Ans: The three representatives were all of them white.)

(ii) Why must the chosen representatives have been chosen because of their whiteness?

(Ans: None of them were in any way natural leaders.)

(iii) Why does the writer think it is a striking story?

(Ans: This class, in racial terms, was a good class.)

(iv) Why does the writer think it was a good class?

(Ans: There was little insecurity, little feeling among the black children that they had to fit into a white framework.)

(v) What evidence does the writer give to show that the black children felt secure?

(Ans: Right from the very beginning they had painted

/themselves

themselves and their families brown or black in their drawings.)

(iii) Recall: As in other experiments, a test of Free Recall was used. As before, subjects' scripts were scored according to successful recall of individual statements, not on the relationships between statements. Details of the marking schemes are presented in Appendix 3.

8.3.1.3. Subjects: The experiment was carried out in Portobello High School, in June, 1974. Subjects belonged to the top academic streams of the third year. Streaming in the case of the classes used had been done with reference to students' marks in language classes, with the exception of the top class, which had been streamed on the basis of English marks.

Five classes were used, here called Class 1, 2, 3, 4 and 5. Classes 1 and 2 formed the first group, consisting of 25 matched pairs, and read texts 1 and 4. The other three classes, consisting of 28 matched pairs, read texts 2 and 3. Matching was done on the basis of subjects' English marks for the final third-year examination, with marks for reading comprehension forming a large component.

8.3.1.4. Procedure: Subjects were given the open-ended question of the first passage they were to read, along with its title. They were asked to read the questions and to be prepared to find the answers in the text they were about to read. The Intrusive Word Test was explained to them. They were allowed 3 minutes for the Test, with the exception of subjects reading Passage 1 'Black and White', who were allowed 2 minutes, since they seemed to be completing it too quickly. Two to three minutes were

/allowed

allowed for answering the questions, then the process was repeated for the second passage. The Recall Tests followed the usual pattern, subjects being allowed 1½ minutes' reading time.

8.3.2. Results: With the exception of Class 5, there were three scores for each subject, Intrusive, Open-Ended Question and Recall. Class 5 did not do the open-ended questions, since, by the time they took part in the experiment, it was obvious that these questions were not having the desired effect on the Intrusive Test. Since the use of the questions tended to complicate instructions given to subjects, they were thus dropped. The scores given below in Table 12 refer to means. Actual scores are presented in Appendix 2.

Table 12

	Passage		Passage	
Group 1:	1A	1B	4A	4B
i. Intrusive	17.0	16.5	22.9	22.0
ii. Questions	1.7	1.0	2.0	1.8
iii. Recall	6.1	6.1	4.7	4.6
Group 2:	2A	2B	3A	3B
i. Intrusive	15.2	15.3	21.7	22.1
ii. Questions	1.0	.6	.8	.7
iii. Recall	3.4	3.0	4.3	3.7

Neither the Intrusive Word Scores nor the Recall Scores show any significant differences in means between the 'A' and 'B' versions of the texts. The mean for the Question score of Passage 1A is significantly higher than the mean for the 'B' text ($t = 3.1$). Thus marking appeared to have a significant effect on subjects' ability to answer questions about this

/text.

text.

A revised marking scheme for the Recall scores, drawn up because of an impressionistic judgement that the scripts of subjects trying to recall Passage 1B appeared incoherent, did produce one other significant difference. It will be remembered that Recall was marked purely according to the number of individual statements subjects recalled. No marks were given for recall of relationships. Thus in Passage 1, for example, if a subject recalled 'It's a striking story.' he scored 1 point. If he also recalled 'This class, in racial terms, was a good class.' he scored another point. And he did so even if the first statement was recalled widely separated from the second, and no relationship between them was discernible in the recall script.

The second, revised marking scheme took inter-sentential relationships into account (see Appendix 3, for details). This meant that S's scored only if they recalled <u>both</u> members of a related pair of statements, and in such a way as made the relationship reasonably clear. This could be accomplished either by the relative positions in the script of the statements, or by marking. Thus in the case of the two statements from Passage 1 already quoted, S's scored if they recalled them as,

> 'It's a striking story. This class, in racial terms, was a good class.'

They failed to score either if they reversed the order without marking,

> 'This class, in racial terms, was a good class. It's a striking story.'

since it was considered that this order did not make the relationship

/clear,

clear, or if they got the relative order right but interposed one or more unrelated statements between the two. If S's used marking to show the relationship, then they scored if they recalled the statements in ways like the following:

i. 'It's a striking story because/since/as etc. this class ... was a good class.'

ii. 'This class ... was a good class so it's a striking story.'

The subject then scored 1 point for each relationship, that is, each pair of related statements correctly recalled. Mean scores obtained for each passage are given in Table 13 below:

Table 13

	Passage		Passage	
Group 1	1A	1B	4A	4B
	1.8	1.2	1.0	.96
Group 2	2A	2B	3A	3B
	1.2	1.1	0.9	0.9

The mean score for Passage 1A is significantly higher than the mean score for 1B, (at the 5% significance level, 1-tailed hypothesis $p < .0475$). It was thus significantly easier to recall the relationships in the case of the 'A' (marked) version of Passage 1 than in the unmarked version. The other scores are not significant.

One other point that arose from this second marking of Recall answers was a slight tendency, on the part of subjects drawn from Class 1,

/of

of Group 1, when attempting to recall the unmarked version of Passage 1, to insert markers. The following markers were correctly inserted into 1B:

'because' - twice
'as' - twice
'for' - once
'so' - once
'in that' - once

There did not appear to be a similar tendency among S's from Class 2, the other class making up Group 1, to do the same. This seems to suggest that subjects from Class 1 were more aware of the relationships in the texts, whether marked or unmarked. It may be remembered that this class was the best English class of the third year.

8.3.3. Discussion: Marking a text for inter-sentential relationships did not make it easier to read as measured by an Intrusive Word Test, even when S's had been directed towards such relationships by questions read before the S's read the text. Recall Tests scored purely for independent statements again showed no significant difference between marked and unmarked texts.

On the other hand, the open-ended questions themselves, while not intended initially as a measure of comprehension, did detect a significant difference between Text 1A and 1B, the 'A' (marked) version being easier than the unmarked version. This suggests that the presence of overt markers, in certain cases at least, makes the relationships easier to understand. A marking scheme for the Recall answers directed at recall

/of

of the relationships also showed the 'A' version of Passage 1 as being easier than the 'B' version. Presumably by making the relationship between a pair of statements clearer, the presence of markers encouraged subjects to recall both members of a pair together.

It was noticeable, although no attempt has been made to quantify the tendency, that when S's failed to score in the open-ended questions, this was not always because they failed to recall accurately a part of the text in question. Frequently, it seems, they did this quite easily, but selected as their answer the wrong part. For example, when asked, in Passage 3,

> 'Why is it a good year for the Russians to reduce arms spending?'

they might reply,

> 'Because Russia tends to underestimate the amount it spends on arms.'

This suggests that, as argued by Bever, (1970) subjects often remember statements but not the relationships between them. Bever, however, suggests that relationships are comprehended, but later forgotten at a faster rate than the actual statements. The evidence here suggests that the relationships are not understood in the first place.

The difference in S's ability to understand and recall individual statements as opposed to their ability to understand and recall the relationships between statements can be seen if we compare scores gained for recall of Passage 1 under the first marking scheme with scores gained under the second scheme. It will be remembered that the first scheme awarded points for recall of individual statements, whereas

/the

the second scheme awarded points only for recall of relationships. The scores given below in Table 14 are in the form of percentage of total possible points gained:

Table 14

	Passage	
	1A	1B
1st Marking	60%	60%
2nd Marking	36%	24%

That is, not only is the 1B mean lower than the 1A mean according to the second scoring scheme, but both percentage scores are lower than those gained under the first scoring scheme. The conclusion seems to be that in this case, subjects seemed to remember the statements more easily than they did the relationships holding between them.

8.4. 2nd Experiment.

8.4.1. Introduction: The first experiment was repeated, in a modified form, at Forrester Secondary School, in the first part of July, 1974. The same texts were used, namely 1. 'Black and White'; 2. 'Political Candidate'; 3. 'Arms Reduction', and 4. 'Crime Statistics'.

8.4.2. Tests: In the light of what had happened when the first version of the experiment was tried out, the following changes were made in the tests used:

(i) The Free Recall Test was eliminated.

(ii) It was replaced by the Open-Ended Questions. This was because

/the

the questions appeared to have been more sensitive to differences between marked and unmarked texts than had the Recall Test. In the case of Passage 1, the difference they had detected had been highly significant, at the .005 level; in the case of Passage 3, the difference detected by the questions had only just missed significance. The Recall Test, on the other hand, had detected a difference only once, with a revised scoring system.

It thus seemed possible that the questions were more sensitive than Free Recall. It must also be kept in mind that in the first part of this experiment, because the questions were linked to the Intrusive Word Test, scores on the questions may have been lower than was necessary, owing to the fact that subjects were not given time to complete their reading of the passage. It therefore seemed possible that Open-Ended Questions could be made more sensitive.

Certain changes were made in the Open-Ended Questions used in the Re-Run of Experiment 4. An attempt was made to increase the number asked, while still keeping them directed at inter-sentential relationships. In one or two cases, changes were also made in order to clarify the meaning of the question. Details of the questions are given in Appendix 1.

(iii) The Intrusive Word Tests were used, but with a different function.

In the Re-Run, these tests were used in combination with the Open-Ended Questions, as before, but this time with the focus of attention on the questions. The Intrusive Word Tests served partly as 'noise', to make answering the questions more difficult, partly to prevent S's from doing a lot of back-checking to find the answers to

/the

the questions, and partly to ensure that S's did not begin to answer the questions until they had come to the end of the passage and had turned it over. In order that S's should have the chance to find all the answers, they had, of course, to be allowed to read all the text. Subjects were allowed the same amount of time to complete the Intrusive tests as in the first version of the experiment. At the end of this time, they were told to stop, and mark the point they had reached by drawing a double vertical line under the last intrusive word they had underlined. They then continued with the Intrusive Word Test in their own time, and when they had finished it, they put the texts away and attempted to answer the questions without consulting the text. As in the first version of the experiment, the Open-Ended Questions, plus the title, were given to the subjects before they started reading the text.

8.4.3. Subjects: There were again two groups of matched pairs. Matching was done on the basis of subjects' marks in the recent third term English examination. Group 1 was made up from classes 3E (i) and 3E (ii), and consisted of 23 pairs, Group 2 was drawn from classes 3E (iii) and 3E (vii) and consisted of 21 pairs. In this case, the classes had been streamed largely on the basis of their performance in mathematics.

Group 1 read Passage 1 ('Black and White') and Passage 2 ('Political Candidate'). Group 2 read Passage 3 ('Arms Reduction') and Passage 4 ('Crime Statistics').

8.4.4. Results: Two scores were counted, namely, score on the Intrusive Word Test achieved inside the fixed time, and score on

/answers

answers to the Open-Ended Questions. Mean scores are summarized in Table 15 below: Actual scores are presented in Appendix 2.

Table 15

	Passage		Passage	
Group 1:	1A	1B	2A	2B
Intrusive Scores:	17.4	18.3	17.0	16.1
Question Scores:	2.7	1.9	2.9	1.9
Group 2:	3A	3B	4A	4B
Intrusive Scores:	18.1	17.1	15.2	16.9
Question Scores:	0.9	1.3	2.0	2.0

None of the differences between Intrusive scores are significant. The difference between the Question scores for Passage 1 are significant at the 5% level, one-tailed hypothesis ($t = 2.3$). The difference between the Question scores for Passage 2 is also significant (in fact highly significant, $t = 2.78$). Thus in the case of the Open-Ended Question Test, the marked versions of Passage 1 and of Passage 2 were significantly easier than the unmarked versions.

In the case of Passages 3 and 4, this test did not detect any significant differences.

8.5. General Conclusions: In the experiments taken as a whole, those significant results that were obtained all confirmed the hypothesis, namely that 'marked' texts should be easier than corresponding 'unmarked' texts. In the first run of the experiment, questions directed at Text 1A were significantly easier than questions directed at 1B. A revised scoring

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scheme, altered to take account of recall of relationships, showed that Text 1A was significantly easier to recall than 1B. In the second run of the experiment, questions directed at Texts 1A/1B and 2A/2B were significantly easier to answer than questions directed at Texts 1B and 2B.

As far as the Open-Ended questions are concerned, it seems likely that they serve to direct subjects' attention to the relationships contained in the text. Once this has been done, the marking of relationships in the 'A' texts makes it easier for subjects to identify the required relationships, so that scores on the 'A' texts are higher than scores on the 'B' texts. That subjects' ability to respond correctly to the questions is not a function of their memory of statements in the text, but rather of their identification and recall of the required relationships between statements, seems to be shown by the fact, already mentioned on p.220, that subjects who had read the 'B' texts often responded with a statement that had occurred in a text but was not the relevant one.

When recall scripts were marked on the basis of subjects' recall of individual statements, no significant differences were found between the 'A' and 'B' texts. This suggests that subjects' recall of statements in a text is not affected by the relationships holding between the statements. On the other hand, when recall scripts were scored in such a way as to take relationships between statements into account, then Text 1A was found to be significantly easier than Text 1B. In this connection, it is interesting that subjects from the academicaly most able group who read Text 1B showed a tendency to insert markers

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of the relationships in their recall scripts. This seems to imply that when subjects are aware of such relationships, then marking has the effect of making the recall of the relationships easier. It may be that marking had no effect on recall of the other texts simply because subjects reading either the marked or unmarked texts failed to recognise the relationships.

Such a conclusion appears to fit in with the findings of Bormuth and associates that the ability of American school children to answer questions based on inter-sentence relationships was startlingly low (Bormuth, Carr, Manning and Pearson, 1970). If this is indeed the case, it is disturbing.

Another possibility is that the relationships did not exist, ie. that the analysis was wrong. However, when the texts used in this experiment, along with others, were tested on adult native speakers, mainly teachers, who had to fill in gaps between statements with appropriate markers of relationships, the agreement between subjects was generally around 70%. It seems that the analysis did, on the whole, represent the relationships accurately.

All the significant results came from Texts 1A/1B and 2A/2B. That is, in the case of Texts 3A/3B and 4A/4B, marking produced no detectable effect. As far as Text 3 is concerned, a possible explanation of this lack of results can be found in the fact that the questions can, to some extent, be answered correctly without the subject consulting the text. For example, faced with the question,

> 'Why should the Soviet Union find it easy to cut the amount of money it spends on arms?'

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a subject could sensibly guess the answer,

'Because it spends too much already.'

and thus score a point. If the questions can be answered without the text being consulted, then whether the text is marked or unmarked becomes ireelevant. It is thus likely that Passage 3 was unsuitable as an experimental text.

In the case of Passage 4, this explanation does not seem to apply so readily. It may be that the text was conceptually too difficult for the subjects. Several of the adults who had tried to fill in the markers in this text remarked that they found it particularly difficult.

CHAPTER 9

CONCLUSIONS

9.1 Introduction: In this chapter, the results of all the experiments are summarized and their significance discussed. Some tentative explanations are offered as to why some forms of rhetorical organisation appear to have affected readability, whereas others do not seem to. The comparative usefulness of the various kinds of test-task are discussed. Finally, suggestions are made concerning further research in the area.

9.2 Summary of Statistically Significant Results:

Experiment 1: Time Organization. Chronological v. non-Chronological (2 pairs of texts used).

1st run: (a) Intrusive Word Test: Texts 1A and 2A (chronological) significantly easier than 1B and 2B (non-chronological).

(b) Recall Test: Text 1A was easier than 1B.
Text 2A did not differ significantly from 2B.

2nd run: (a) Intrusive Word Test: Text 1A was easier than 1B.
Texts 2A and 2B did not differ significantly.

(b) Recall Test: Texts 1A and 2A were easier than Texts 1B and 2B.

Comments: There are puzzling aspects about these results, some of which have already been discussed (Chapter 5). On the whole, however, the results confirm the hypo-

thesis/

thesis that chronologically ordered texts are more readable than non-chronologically ordered alternatives.

Experiment 2: Space Organization: Linear v. non-linear (2 pairs of texts used).

1st version: (a) Intrusive Word Test: no significant results.

2nd version: (a) Intrusive Word Test: Texts 1A and 2A (linear) were significantly easier than Texts 1B and 2B (non-linear) respectively.

Comments: On this occasion, the intrusive word test produced no significant results. The recall test, however, produced results in line with the hypothesis. As in Experiment 1, this is evidence that readability can be affected by rhetorical organization.

Experiment 3: Hypotactic v. Paratactic Texts.

1st version: (6 pairs of texts used).

(a) Intrusive Word Test: No significant results.

(b) Recall Test: Texts 2B and 5B (paratactic) were easier than texts 2A and 5A (hypotactic). Other texts did not differ significantly.

2nd version: (2 pairs of texts used).

(a) Cloze Test: 2B was easier than 2A
5B did not differ from 5A.

(b) Guided Recall: 5B was easier than 5A.
2B did not differ from 2A.

Re-Run/

Re-Run of 1st Version: (2 pairs of texts used).

(a) Intrusive Word Test: No significant results.

(b) Recall Test: No significant results.

Comments: On no occasion did the Intrusive Word test result in significant results. Recall tests did on two occasions out of six, a Cloze test on one occasion out of two, and a Guided Recall test likewise. All the significant results are in the same direction, suggesting that paratactic texts are easier than hypotactic ones. However, in this experiment, differences in rhetorical organisation were confounded with differences in content. Moreover, in the second re-try of the experiment, the significant results obtained in the first run were not replicated. Thus all the results must be regarded with some suspicion.

Experiment 4: Marked v. unmarked Hypotactic Texts.

(4 pairs of texts used).

1st version: (a) Intrusive Word Test: No significant results.

(b) Open-Ended Questions: Text 1A (marked) was easier than 1B (unmarked). The other texts did not differ significantly.

(c) Recall Test (scored to take account of inter-sentential relationships): Text 1A was easier than 1B.

2nd version: (a) Intrusive Word Test: no significant results.

(b) Open-Ended Questions: Texts 1A and 2A were easier than Texts 1B and 2B. The other texts did not differ significantly.

Comments:/

Comments: In this experiment, significant results are comparatively few in number, relative to the number of texts involved and number of tests used. What significant results were obtained suggest that marking relationships increase the readability of a hypotactic text.

9.3 General Conclusions: The study set out to discover whether it was possible to affect the readability of study texts by varying features of their overall rhetorical organization. The main conclusion seems to be that this is, in fact, possible; all the experiments yielded some significant results, although the results of Experiments 3 and 4 are generally less convincing than those of Experiments 1 and 2.

One feature of the overall results which requires discussion is why the first two experiments were relatively more successful than the second two. Such a discussion, however, is related to further research, and will thus be taken up at a later point. Before doing this, the various types of test-task will be reviewed.

9.4 Review of Main Test Tasks: The main aim of this study was to examine the effect of rhetorical organization on readability. A subsidiary aim, however, which developed in the course of the study, was to compare the sensitivity of different types of comprehension-eliciting techniques. The concept of 'readability' cannot in practice be separated from that of 'comprehension.' To state that one text is more readable than another, in a study context, must mean that it is in some way more easily comprehended. It seems obvious, however, that there are different levels of comprehension, and that therefore

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a test which measures comprehension at one level may not detect lack of comprehension at a higher level. A reader may be quite capable of answering sentence-bound questions, while much less able to perform higher-level tasks, such as summarizing what he has read. This has important pedagogical implications: if a student is trained only in presumably low-level comprehension tasks, e.g. answering 'sentence-bound' questions, then he may be unable to cope with higher level tasks encountered either in a different type of examination, or in a self-motivated study context. If we can show that success in different levels of comprehension task do not correlate highly, then this is an argument in favour of training students in many different types of comprehension exercise. In a number of cases in this study, the Intrusive Word Test detected no significant differences in subjects' speed/comprehension, whereas the Free Recall Tests were more sensitive to differences in textual organisation, and to the effects that such differences have upon subjects' ability to process and recall a particular text. This then becomes an argument in favour of using some form of overall recall test as a measure of readers' grasp of a text as a whole.

9.4.1. The Intrusive Word Tests: These tests, which were intended as a measure of subjects' reading speed together with some form of comprehension, produced significant results in both cases in the first run of Experiment 1, and in one case out of two in the second run of the experiment. Apart from these three instances, the tests detected no other differences. One must, therefore, assume that at the level at which this task tests comprehension, differences in rhetorical organization are irrelevant.

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One is led to conclude that this test is sentence-bound. Certainly, as argued in Chapter 3, it is possible to answer the test using information on each occasion gained from isolated sentences. Yet this conclusion does not provide a totally satisfactory explanation of the fact that the test appeared to be sensitive to organizational differences in both pairs of texts used in Experiment 1 (1st try) and in one pair in the re-try. It is, of course, possible to argue that in Text 1B (non-linear), clause order in sentences violated chronological sequence more often than was the case in 1A (linear). Given the premiss that such violations of chronological order at clause level causes difficulties, this would in part explain why a sentence- bound test detected differences in this case. Such an argument would not explain why Text 2B proved more difficult than 2A on the first run, since in 2B violation at clause level did not occur. But since this result was not replicated in the second try of the experiment, it may have been a sport. What this argument cannot seemingly account for is the fact that, as described above in Chapter 5, Smith and McMahon (1972) found that violation of chronological ordering at clause level did <u>not</u> affect subjects' comprehension, whereas the Clarks (1968) found that it <u>did</u> affect subjects' ability to <u>recall</u> sentences. If the Intrusive Word Test is strictly sentence-bound, then according to Smith and McMahon's findings, it should not have been affected by differences in organization at sentence level. The evidence from Experiment 1 suggests that when a subject reads a narrative sequence, some form of processing goes on which is affected by the overall organization of the text, and that the Intrusive Word Test was sensitive to differences in subjects' ability to accomplish this processing.

9.4.2 Free Recall: Free Recall proved to be a sensitive test in the case of Experiments 1 and 2 (Natural Principles) but much less successful in the case of Experiments 3 and 4 (Rhetorical Principles). This, apart from providing some empirical support for the validity of the distinction, suggests that further tests are needed to measure subjects' comprehension of hypotactic relationships.

As normally used in this study, Free Recall does not explicitly measure inter-sentential relationships. This did not seem to matter in the case of paratactic texts, since overall organization appeared to affect recall of individual statements. It becomes important, however, when hypotactic texts are used. Here the relationships exist almost purely between statements, rather than, as is the case with paratactic texts, being a function of the statements and the events or objects in the outside world which they describe. In many cases in Experiments 3 and 4, subjects appeared to recall hypotactic texts virtually as unordered strings of statements, and it was impossible to judge whether the relationships had been comprehended.

With hypotactic tests, therefore, it seems advisable to use some other form of test. Open-ended questions were used in Experiment 4, and produced some significant results. They have the disadvantage, however, of forcing an interpretation on subjects, and hence possibly cueing them to a relationship which they might otherwise have missed.

A fairly obvious alternative to Free Recall would be some kind of summary task, which, by requiring subjects to select, would force them to judge the relative importance of, and hence, to some extent, the relationship between, different statements. Summary tasks would also have the advantage of being more suitable with longer texts, the use of

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which is advocated later in this chapter (9.6.4). Summary writing would have to be taught prior to the experiments.

9.4.3. Other Tests: The three other tests used, Guided Recall, Cloze Procedure, and open-ended questions, were not used often enough to judge their sensitivity.

9.5 Unsolved Problems in the Experimental Findings:

Taking the experimental results as a whole, there are two problems which must be discussed.

(1). It is not clear why the Intrusive Word Test produced significant results in parts of Experiment 1 but not in Experiment 2, while in both cases, Free Recall detected differences between the members of a pair.

A possible answer is that in reading a narrative sequences, the reader attempts to arrange the data in a fixed chronological series, and that the ease with which this can be accomplished depends on how closely clause order within sentences, as well as the sentences themselves, adhere to this order. That is, given a narrative sequence 'B-A', where B is the second event, the reader may have little difficulty understanding it, though, as the Clarks found, he may reorder it to 'A-B' in recall. However, given a sequence such as D-C, B-A, F-E, where A is the first event, B the second etc., the reader is motivated to order the sequence as A-B, C-D, E-F. He has a great deal of re-ordering to do, and this may slow the reading process.

In the case of descriptive texts, there is nothing quite equivalent to the parallelism between chronology and clause order that exists in narrative texts. Hence the reader has no motivation to re-order clauses. Hence a test which is sensitive to difficulties at sentence

level/

level is unlikely to detect differences in organization above sentence level.

(2). The second problem to be discussed is why Experiments 3 and 4, which involved 'hypotactic' tests, proved much less successful than the previous two experiments, which involved 'paratactic' texts. I think we can dismiss Experiment 3. As stated before, in this experiment differences in rhetorical organization were confounded with differences in content. This not only makes the scoring of results very difficult, if not impossible, but it also makes it impossible to select a text task appropriate to both types of text. An assumption was made that the 'hypotactic' texts contained more information, in a sense, than the 'paratactic' texts. Comprehension of the former required recognition of the inter-sentential relationships, as well as the propositional content of the sentences. Comprehension of paratactic texts did not. But elicitation of this extra comprehension factor requires an extra test-task, which would not be appropriate in the case of paratactic texts. In the absence of this, there is no real way of knowing whether subjects reading the hypotactic texts comprehended the extra information. Thus it seems likely that it is impossible to compare the relative difficulty of the two types of text.

The results of Experiment 4 are slightly more difficult to explain. Here content was held constant, the difference between the two types of text residing in the presence or absence of inter-sentential 'marking.' It seems reasonable to assume that such marking, by making clear the rhetorical force of an utterance, should in some sense make a text more comprehensible. Yet only in one case did Free Recall detect a significant difference between marked and unmarked texts. Open-ended

questions, on the other hand, detected a significant difference in two out of four cases. The following suggestions might be made:

(1) Free Recall of statements does not yield any clear evidence as to whether the relationships between the statements has been comprehended. The second marking scheme used in Experiment 4 did attempt to take account of this, but in a rather crude way. Thus it might be argued that subjects reading the marked texts comprehended better than subjects reading the unmarked texts, but that the measures used were not sensitive enough to detect this difference.

(2) Alternatively, it might be argued that the relationships between the utterances were so obvious that marking was redundant. It seems obvious that we employ marking only in those cases in which we predict that without it the relationships may not be obvious to a reader. This would call for the use of more obscure texts, which would make subjects more dependent upon marking.

(3) A third possibility is that the relationships were simply not comprehended at all, regardless of whether or not they were marked. This might seem an extreme conclusion, but there already exists some evidence that school-children are poor at detecting such relationships (cf. Bormuth, Manning, Carr and Pearson, 1972). In Experiment 4, and, to some extent, Experiment 3, there appeared to be indications that the relationships between statements had been lost in recall. It seems at least possible that they had not been lost but, in fact, never acquired.

Reid (1973) has remarked that 'the way in which people perceive print is a function of their awareness of the linguistic properties of

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what they are reading.' In Experiments 3 and 4, it was assumed that (a) the relationships being used had external validity (which it seems difficult to dispute) and (b) that children aged 14/15 would be aware of and would recognize them. But if this awareness does not exist, or exists very incompletely, then both experiments would break down and yield inconclusive results.

If there is any substance in suggestion (3), then any experiments with hypotactic relationships would have to be preceded by a programme designed to ensure that subjects were aware of such relationships in print.

9.6 Suggestions for Further Research:

9.6.1. Communication Context: In view of the vast amount of reading research that has been done, it is surprising how little is known about how and what people learn through reading.[1] In fact, it is only in recent years that learning through reading has become a focus of research interest.

Several writers have drawn attention to the need for reading comprehension to be reviewed in the total communication context (cf. Freedle and Carroll, 1972, p.359; Schlesinger, 1968, p.158; Olson, 1972, p.148). The actual reading text is only one factor in a learning situation, which includes the reader, his purpose in reading, degree of motivation, and his prior knowledge.

A focus on the reader, almost to the exclusion of the text, is apparent in the 'mathemagenic' approach. In this approach, attention is focussed on the reader, his motivation, strategies, the instructions

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1 This is not restricted to reading. Very little is known about the amount of learning accomplished by students listening to a lecture.

he is following, etc. There is no doubt that this approach produces valuable results. Rothkopf has found that questions embedded in a text affect the reader's performance on criterion tasks performed after reading (Rothkopf, 1972). Marton has found that readers' strategies, and general approach to a text, e.g. whether they set out to 'make sense of it' and to find out what the writer is trying to communicate, as opposed to just trying to 'follow the words' affects the eventual degree of learning (Marton, 1975). Thomas and Augstein discovered that instructions given prior to reading affected the way their subjects approached the text, and the amount and type of information they derived from it (Thomas and Augstein, 1972).

A weakness of the mathemagenic approach is that by focussing exclusively on the reader, it is in danger of ignoring the fact that reading is an interaction between reader and text. Ideally a valid approach should focus on the way in which the contents and structure of a text interact with the reader's prior knowledge, expectations as to the content of the text, anticipation of possible structuring, etc.

In the experiments described in this study, subjects approached the texts 'cold.' There was no preparation; motivation for reading was supplied exclusively in terms of the experimental tasks; prior knowledge was taken into account only in as far as an attempt was made to reduce its effect.

But it may be that for a text to be properly understood, it must be read in an appropriate context. Consider, for example, Text 5A of Experiment 3, 'The Jews.' The function of the Primary Passage upon which this text was based was to expose certain fallacies about Jews. It was aimed at readers who either shared these fallacies, or lacked enough knowledge to contradict them. When the writer asserts, 'The

Jews do not form a nation' and then proceeds to substantiate this, there is a covert presupposition ('many people think that the Jews form a nation') and similarly in the case of all the other assertions. If the reader is unaware of these presupposed fallacies, then presumably the argument is for him irrelevant and possibly meaningless. Hence rhetorical organization may be irrelevant.

A way out of this is to fit the reading text into a wider context which will make it more meaningful. Thus in the case of Passage 5A, a reading might be preceded either by class discussion of what was known about Jews, commonly held notions, etc. This would hopefully have the result, when subjects began reading, of making them pay attention to what the writer was trying to communicate, what assertions he made, the way in which he substantiated these assertions, etc. It might then be that rhetorical features such as marking, linear justaposition etc. would have an effect on what was learned.

9.6.2. Prior Knowledge: As is implied above, our recognition of inter-sentential relationships is probably affected in many cases by prior knowledge which we bring to a text. It has already been pointed out (6.2.3) that a text such as

> 'Amphioxus is closely related to the vertebrates. This little animal has no backbone ...'

is likely to be confusing if we do not know that possession of a backbone is a characteristic of vertebrates. It might be possible, by controlling the amount of prior knowledge available to different groups of subjects, to affect the efficiency with which they read a text. For example, if we were using the following text:

> 'Some extinct civilizations seem to have been helped on their way by the disappearance of their natural resources.

The/

The Mayas of Guatemala created deserts by the destruction of forests.'

we could supply one group of subjects with the information that the Mayas were an extinct civilization, and withhold this information from the other group. It might be that this would enable the first group to recognize the inter-sentential relationships more easily, and that this would be reflected in their performance in test-tasks. If such a difference were found, we could then investigate whether it was diminished by the addition to the text of markers.

9.6.3. Pre-Training: Subjects' prior training in recognizing rhetorical relationships can be regarded as a sub-unit of their knowledge structure prior to the experiment. It has already been suggested that one of the reasons for the comparative lack of success of Experiments 3 and 4 was subjects' failure to recognize inter-sentential relationships. Prior training in recognizing rhetorical relationships might thus be used as an experimental variable, one experimental group having had the training, one not. It could then be established whether the training had an effect in the context of the test-tasks being used, whether a particular structuring of the text enabled a trained group to use their training more effectively, and, perhaps more interesting, whether training enabled subjects to impose relationships on a 'badly-written' text, as I suspect skilled readers do.

9.6.4. Additional Textual Variants: This study restricted itself to inter-sentential, or inter-clause, relationships. From a practical point of view, however, this is to operate at a comparatively micro-level. Readers must handle texts vastly longer than the paragraph-sized items used in this study. Using longer texts, we might examine the effect

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of paragraphing of various kinds, paragraph connectors, repetition of items, etc. In doing so, however, we would have to drop Free Recall as a test-task, since it is unreasonable to expect readers to recall and write down very large chunks of text. An obvious substitute, as mentioned above (9.4.2), is summary. Summary writing, however, requires prior training, so that experiments with longer texts could be conducted in the framework of a training programme as advocated above.

9.6.5. Readers' Processing of Texts: Because this study was done with an educational context in mind, certain self-imposed restrictions were accepted. It was assumed that there were certain educationally desirable goals, such as speed of reading, completeness of recall, etc., and subjects were measured in relation to how closely they approached these goals. This approach, while probably necessary, had the result that many interesting indications of the way in which readers processed texts had to be ignored. This is unfortunate, since we know comparatively little about the way in which readers operate with relatively large amounts of language data. The Free Recall tests gave the best indications of mental processing, some of which are briefly described below:

(1) Inferences: Bransford and Johnson (1972) report subjects' tendency to impose inferences on sentence-length texts. For example, a significantly large number of subjects who had seen the sentence

'The floor was dirty because she used the mop'

claimed later in a recognition test that they had seen the sentence 'The mop was dirty.' The Free Recall tests used in this study gave evidence of this, together with indications of inferences being made across much wider stretches of text.

As/

As an example of a sentence-based inference, Text 3A, Experiment 3, stated that birds of prey were drawn to motorways because the steep grassy banks provided 'ideal breeding grounds for voles.' A large number of subjects stated in their recall answers that the attraction of the motorways was the fact that there were large numbers of voles there. An example of inferential reasons over a wider stretch of text comes from recall scripts of Text 5 of the same experiment. At quite widely separated points, the text stated that

(a) the Lopsong was a solitary animal except during the brief mating season, and

(b) that the Lopsong stayed most of the year in the mountains but came down to the foothills in June and July.

Several subjects inferred from this that the mating season occurred in June and July.

(2) Imposed Synonymy: It was often obvious from recall scripts that subjects regarded quite widely separated phrases or sentences in a text as synonymous, since they frequently inter-changed them in recall. Two examples of this process are given below:

(a) Text 1 (Experiment 1) contained the two sentences,

'In doing this (digging) you will see what the soil is like to work with' and

'As you dig, the kind of soil will show you how large you can make the cave.'

Subjects often either transposed these sentences in the order of their recall scripts, or, more commonly, transposed one into the original position of the second, which

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was then omitted. Thus it looks as if the two sentences were regarded as synonymous, and hence interchangeable, and that because of this apparent synonmy, one was considered redundant.

(b) Text 2 of Experiment 1 contained, at quite separate points, the two sentences,
'Atrocious weather set in' and
'The climbers worked in incredibly severe weather.'
Again, subjects appeared to treat these as synonymous, as above, either transposing them or recalling only one, often transposed to the original position of the other.

Such indications of readers' mental operations are not simply of purely academic interest. All competent readers must form inferences, for example. But some inferences may be more valid than others. The 'voles' inference above is clearly valid, i.e. it would be accepted by most readers; the 'Lopsong' inference is probably borderline. With more knowledge as to what prompts readers to form inferences we shall be in a position to give more educated advice to writers in order to exclude material that is likely to result in confusion or wrong interpretation.

9.7 Final Conclusions:

At present, and for the forseeable future, we rely greatly on written texts to supply us with learning material. Yet as has already been suggested, we know comparatively little about how readers learn from texts, and how their performance may be improved. This study took a limited, Discourse Analysis orientated approach to the problem. Any really

valuable/

valuable approach will have to be multi-disciplinary, involving Psychology, Linguistics, Ethnomethodology, Sociology, Information Science, etc. In Applied Linguistics, it seems likely that one of the most profitable areas to examine in detail is inter-sentential relationships. We need to know how often such relationships are recognized, and what part is played in this recognition by readers' prior knowledge and by their ability to form inferences. Finally we need a generally accepted method of testing this area of comprehension.

There is at the moment in this country considerable interest in the problems of people who are illiterate or near illiterate. It is to be hoped that in future, there will be greater awareness of the problems facing readers who have passed this stage, and yet lack the training to make full use of their abilities.

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APPENDIX 1.

TESTS

EXPERIMENT 1

(a) INTRUSIVE WORD TESTS

1A (Int).

There are two kinds of occurred cave: earth ones not and stone has ones. The earth caves are dug into lung the hillside. Having selected a place where the earth the seems to be of of the right kind, you smooth the cancer hillside increase so that you have a vertical face. In same doing this, the you will see what the soil is like smoking to work with. Next, cigarette you make a first hole of two by seven been feet, and dig in for recently roughly three feet before you start enlarging until. As you dig, has the kind of soil will show where you Iceland how large you can make the cave the, vice versa. Having dug out your cave in, you polish step the earth walls to a make them smooth, then you plaster them with mud cream made ice of firm of earth. All this consumption time, you leave the outer wall untouched, using and just the little opening refrigerators that you made at the beginning of, but use once the cave is finished you open up this an wall so that you have a door with and a window.

1B (Int).

There are two kinds of occurred cave: earth ones not and stone has ones. The earth caves are dug into lung the hillside. You smooth the hillside so that you the have a vertical face of, having selected a place where the cancer earth increase seems to be of the right kind. As same you smooth, the you will see what the soil is like smoking to work with. Next, cigarette you make a first hole of two by seven been feet and dig in for recently roughly three feet. All the time you until dig, you

will/

will has use just this little opening you where made Iceland at the beginning, leaving the outer in wall untouched. Once the cave is is finished, however, argument in order to have a door and the a window, you will open up this wall in. You start step enlarging and dig a out your cave. As you dig the kind of soil cream will ice show you of how large you consumption can make the cave. The harder and closer and the soil is the refrigerators larger your cave can be and of vice use versa. Then, before plastering the earth walls with mud an made of firm earth you polish them with to make them smooth.

'Intruded' words: occurred, not, has, lung, the, of, cancer, increase, same, the, smoking, cigarette, been, recently, until, has, where, Iceland, in, is, argument, the, in, step, a, cream, ice, of, consumption, and, refrigerators, of, use, an, with. (35).

2A (Int).

The British live Everest expedition arrived in Katmandu late in August, and set up become base can camp on the 29,028 foot mountain early in September. Progress was quick until the touch weather delayed the setting up of may Camp Five at 26,000 feet user for several days. It was finally established on November 4, but from the then on the which climbers worked in 'incredibly iron severe weather' with temperatures around -40 deg. Fahrenheit, and of wind that made every movement a struggle. Climbers from the team of 11 were struggling parts to set up Camp Six on the previously some unclimbed south-west face of Everest when atrocious weather set in, forcing the climb to be deteriorates abandoned 2,028 feet from the top. The camp is insulation the highest point that any climber has reached on the mountain in autumn if, and it was from there that Hamish element MacInnes and Dougal Haston were the to have launched their attempt on the summit as. But furious winds made it impossible to keep the box-type tents in position, such and completely ruled out the possibility of climbing the hottest hazardous 2,000 feet to the top. The extreme winds and persistent trouble with the their tents forced the expedition to turn back yesterday.

2B (Int).

Extreme winds live and persistent trouble with their tents forced the British Everest expedition become to can turn back 2,028 feet short of the 29,028 foot peak yesterday. Climbers from the touch team of 11 had been struggling may to set up Camp Six user on the previously unclimbed south-west face of Everest when atrocious weather the set it, forcing which the climb to be iron abandoned. The camp is the highest point that any climber of has reached on the mountain in the autumn,

and/

and it was from there that Hamish parts MacInnes and Dougal Haston were to have launched some their attempt on the summit. But furious winds made it impossible to keep the box-type deteriorates tents in position, and completely ruled out any possibility insulation of climbing the hazardous 2,000 feet to the top. The expedition arrived in if Katmandu late in August, and set up element base camp on the mountain the early in September. Progress was quick until the the weather delayed the setting up of Camp Five at 26,000 feet for several days such. It was finally established on November 4, but from hottest then on the climbers worked in 'incredibly severe weather' with temperatures around the -40 deg. Fahrenheit, and wind that made every movement a struggle.

Words 'intruded': live, become, can, touch, may, user, the, which, iron, of, parts, some, deteriorates, insulation, if, element, as, such, hottest, the. (20).

(b) CLOZE TESTS

1A.

There are two kinds ..... cave: earth ones and ..... ones. The earth caves ..... dug into the hillside. ..... selected a place where ..... earth seems to be ..... the right kind, you ..... the hillside so that ..... have a vertical face. ..... doing this you will ..... what the soil is ..... to work with. Next, ... make a first hole ..... two by seven feet ..... dig in for roughly ..... feet before you start ..... . As you dig, the ..... of soil will show ..... how large you can ..... the cave. The harder ..... closer the soil is ..... larger you can make ..... cave and vice versa. ..... dug out your cave, ... polish the earth walls ..... make them smooth, then ..... plaster them with mud ..... of firm earth. All ..... time, you leave the ..... wall untouched, using just ..... little opening that you ..... at the beginning, but ..... the cave is finished ..... open up this wall ..... that you have a ..... and a window.

1B.

There are two kinds ..... cave: earth ones and ..... ones. The earth caves ..... dug into the hillside. ..... smooth the hillside so ..... you have a vertical ....., having selected a place ..... the earth seems to ..... of the right kind. ..... you smooth, you will ..... what the soil is ..... to work with. Next, ... make a first hole ..... two by seven feet ..... dig in for roughly ..... feet. All the time ..... dig, you will use ..... this little opening you ..... at the beginning, leaving .....

outer/

outer wall untouched. Once ..... cave is finished, however, ... order to have a ..... and a window, you ..... open up this wall. ..... start enlarging, and dig ..... your cave. As you ..... the kind of soil ..... show you how large ..... can make the cave. ..... harder and closer the ..... is, the larger your ..... can be and vice ..... . Then, before plastering the ..... walls with mud made ..... firm earth, you polish ..... to make them smooth.

1B (2)

There are two kinds ..... cave: earth ones and ..... ones. The earth caves ..... dug into the hillside. You ..... the hillside so that ..... have a vertical face, ... selected a place where ..... earth seems to be ..... the right kind. ..... you smooth, you will ..... what the soil is ..... to work with. Next, ... make a first hole ..... two by seven feet ..... dig in for roughly ..... feet. All ..... time you dig, ... will use just ..... little opening you ..... at the beginning, leaving the ..... untouched. ..... the cave is finished, however, ... order to have a ..... and a window, ... will open up this wall. You start ....., and dig out your cave. As you dig the ..... of soil will show ..... how large you can ..... the cave. The harder ..... closer the soil is, ... larger ..... cave can be and vice versa. ....., before plastering the earth walls with mud ..... of firm earth, ... polish them ..... make them smooth.

2A.

The British Everest expedition ..... in Katmandu late in ....., and set up base ..... on the 29,028 foot ..... early in September. Progress ..... quick until the weather ..... the setting up of ..... Five at 26,000 feet ..... several days. It was ..... established on November 4, ... from then on the ..... worked in 'incredibly severe .....' with temperatures around -40 deg. ..... and wind that made ..... movement a struggle. Climbers ..... the team of 11 ..... struggling to set up ..... Six on the previously ..... south-west face of ..... when atrocious weather set ....., forcing the climb to ..... abandoned 2,028 feet from ..... top. The camp is ..... highest point that any ..... has reached on the ..... in autumn, and it ..... from there that Hamish ..... and Dougal Haston were ..... have launched their attempt ..... the summit. But furious ..... made it impossible to ..... the box-type tents ..... position, and completely ruled ..... the possibility of climbing ..... hazardous 2,000 feet to ..... top. The extreme winds ..... persistent trouble with their ..... forced the expedition to ..... back yesterday.

2B.

Extreme winds and persistent ..... with their tents forced ..... British Everest expedition to ..... back 2,028 feet short ..... the 29,028 foot peak ..... . Climbers from the team ..... 11 had been struggling ..... set up Camp Six ..... the previously unclimbed south-..... face of Everest when ..... weather set in, forcing ..... climb to be abandoned. ..... camp is the highest ..... that any climber has ..... on the mountain in ..... autumn, and it

was/

was ..... there that Hamish MacInnes ..... Dougal Haston were to ..... launched their attempt on ..... summit. But furious winds ..... it impossible to keep ..... box-type tends in ..... and completely ruled out ..... possibility of climbing the ..... 2,000 feet to the ..... . The expedition arrived in ..... late in August, and ..... up base camp on ..... mountain early in September. ..... was quick until the ..... delayed the setting up ..... Camp Five at 26,000 ..... for several days. It ..... finally established on November ....., but from then on ..... climbers worked in 'incredibly ..... weather' with temperatures around -40 ..... Fahrenheit, and wind that ..... every movement a struggle.

2A (2)

The British Everest expedition arrived in ..... late in August, and ..... up base camp on ..... 29,028 foot mountain early in September. ..... was quick until the ..... delayed the setting up ..... Camp Five at 26,000 feet ..... several days. It was ..... established on November 4, ... from then on the ..... worked in 'incredibly severe .....' with temperatures around -40 deg. ....., and wind that made ..... movement a struggle. Climbers ..... the team ..... 11 were struggling ..... set up Camp Six ..... the previously unclimbed south-..... face of Everest when ..... weather set in, forcing ..... climb to be abandoned 2,028 feet from ..... top. ..... camp is the highest ..... that any climber has ..... on the mountain in autumn, and it was ..... there that Hamish MacInnes a..... Dougal Haston were to ..... launched their attempt on ..... summit. But furious winds ..... it impossible to keep ..... box-type tents in ....., and completely ruled out ..... possibility of climbing the ..... 2,000 feet to the ..... . The

extreme/

extreme winds and persistent ..... with their tents forced .....

expedition to ..... back ..... .

EXPERIMENT 2

INTRUSIVE WORD TESTS

1A.

The reptilian egg has pine a complicated structure to which we must devote some attention. On the to exterior the whole egg structure is stiffened and protected then by a firm shell. Lying beneath the shell is a membrane called the forests chorion, which has developed from and of is connected to a second membrane called to the heater amnion. The amnion, which is attached to way the skin of the embryo, encloses a large gave, liquid-filled cavity which develops about the body of the embryo. It provides protection against injury and these the danger of becoming too as dry. As a food supply for the embryo, the egg contains a large amount of nourishing window yellow yolk, which villages is contained in small a sac carry connected with the digestive tract. Out from the back end of the embryo's body straight there grows a tube and sac, the allantois, in which the waste matter road of the body is traffic deposited. The shell is porous. Blood vessels surrounding the allantois city carry to the embryo oxygen which the has passed in through the them porous shell of the egg, so that the allantois acts as a lung.

1B.

The reptilian egg has pine a complicated structure to which we must devote some attention. As a to food supply for the embryo, the egg contains a then large amount of nourishing yellow yolk, which is contained in a sac connected forests with the digestive tract. A membrane of called the amnion, which is attached to to the skin of the embryo, encloses a way large, liquid-filled cavity which develops about the body

gave of the embryo. It provides protection against injury and the danger of becoming too dry. Developing these from this, and connected to as it is a second membrane, called the chorion, which lies beneath the shell. Out from the window back end of villages the embryo's body small there grows carry a tube and sac, the allantois, in which the waste matter of the body straight is deposited. The whole egg structure is stiffened and protected by a firm road shell on the exterior traffic. The shell, however, is porous. Blood vessels surrounding the allantois city carry to the embryo oxygen which the has passed in through the them porous shell of the egg, so that the allantois acts as a lung.

Words intruded: pine, to, then, forests, of, to, way, gave, these, as window, villages, small, carry, straight, road, traffic, city, the, them.

2A.

Chlamydomonas consists of only a single eggs cell, but in that cell is contained all the essential attributes of a complete plant birds. It is usually egg-shaped, one end being somewhat five pointed. From the pointed end loot sprout two the very fine protoplasmic 'tails' which by their waving movements enable the tiny organism to swim actively found in the water in which it lives officers. They are called flagella, from the Latin word 'flagellum', meaning a whip. The car most conspicuous object in the Chlamydomonas cell is a large green chloroplast thieves. The the form of this varies from species to species, but it is in usually cup-shaped, and it is situated at the hinder end of the cell and, of which it occupies roadblock more than half. The remainder of the cell a is occupied by the living protoplasm, and this contains a up nucleus, which is who usually partly hidden in the police cup formed by the chloroplast. On one side of called the chloroplast there is usually a pyrenoid, similar to those found in Spyrogyra. Some species of he Chlamydomonas have more than complete one was pyrenoid, and may even have more evidence than one chloroplast.

2B.

Chlamydomonas consists of only a single eggs cell, but in that cell is contained all the essential attributes of a complete plant birds. First there is the nucleus, surrounded by the living five protoplasm, which is situated in loot the topmost the end of the cell, of which it occupies rather less than half. The nucleus is usually officers partly hidden in the cup formed by found the large green chloroplast occupying the remainder of the cell. The chloroplast, which car is the most conspicuous object in the Chlamydomonas cell varies in form thieves from

species/

species the to species, but it is usually cup-shaped. On one side in of the chloroplast there is usually a pyrenoid, similar to those found in Spyrogyra and. Some species of Chlamydomonas roadblock have more than one pyrenoid, and may even a have more than one chloroplast. The cell itself is usually up egg-shaped, one who end being somewhat pointed. From police the pointed end sprout two very fine protoplasmic tails, called which by their waving movements enable the tiny organism to swim actively in the water in he which it lives. They complete are was called flagella, from the Latin word evidence 'flagellum', meaning a whip.

Words intruded: eggs, birds, five, loot, the, found, officers, car, thieves, the, in, and, roadblock, a, up, who, police, called, he, complete, was, evidence.

EXPERIMENT 2

RETRY: INTRUSIVE WORD TESTS

1A.

The ten reptilean egg years has a complicated structure to which we successful must devote some seven attention. On the exterior the whole egg structure is least stiffened and protected by at a firm shell. Lying beneath the shell is of a membrane called the chorion, which cycle has developed from, and is a connected to a second membrane called the amnion. The entering amnion, which is attached to the was skin of the embryo, encloses a large, liquid-filled and cavity which develops about the cup body of the of embryo. It provides protection against injury and a the from danger of becoming too emerging dry. As was a good supply for the embryo, the egg he contains him a large amount of nourishing told yellow yolk, which, as the embryo grows, is contained fail in a to sac connected with the seemed digestive tract. Out from the back touched end of the embryo's body there grows everything a tube and luck sac, the allantois bad, in which of the streak waste matter of the body is deposited. The shell a is porous. Blood vessels surrounding over the allantois carry to the embryo despair oxygen which has passed in through the porous to shell, so that the beginning allantois acts as a lung.

1B.

The ten reptilean egg years has a complicated structure to which we successful must devote some seven attention. As a food supply for the embryo, the least egg contains a large at amount of nourishing yellow yolk, which is contained of in a sac connected with the cycle digestive

tract/

tract. A membrane called a the amnion, which is attached to the skin of entering the embryo, encloses a large liquid-filled was cavity which develops about the body of the and embryo. It provides protection against cup injury and the of danger of becoming too dry. Developing from a this, from and connected to it emerging is a was second membrane, called the chorion, which lies beneath he the him shell. Out from the back told end of the embryo's body there grows a tube fail and sac to, the allantois, in which seemed the waste matter of the body touched is deposited. The whole egg structure is everything stiffened and protected luck by a firm bad shell on of the streak exterior. The shell, however, is porous. Blood vessels surrounding a the allantois carry to the over embryo oxygen which has passed in despair through the porous shell of the egg, so to that the allantois beginning acts as a lung.

Words intruded: ten, years, successful, seven, least, at, of, cycle, a, entering, was, and, cup, of, a, from, emerging, was, he, him, told, fail, to, seemed, touched, everything, luck, bad, of, streak, a, over, despair, to, beginning.

2A.

Chlamydomonas consists of only a colour single cell, but in that cell is off contained all slightly the even essential attributes of a complete plant. It is usually feel egg-shaped, one end you being somewhat pointed. From the pointed end sprout if two very fine protoplasmic doctor tails which by their waving movements a enable to the tiny organism straight to swim actively in the water go in which it lives. They are called flagella, from and the Latin word 'flagellum', meaning a whip. The jabs most conspicuous proper object in the Chlamydomonas cell is a the large green chloroplast. The form all of this varies from get species to species, but it is liver usually cup-shaped, and it is situated at you the hinder end of the cell, of which tree it occupies more than half. The of remainder of the cell is end occupied by the living protoplasm, and this contains a other nucleus, which is the usually to partly hidden in the plane cup formed by the chloroplast. On a one side of the chloroplast there is on usually a pyrenoid you, similar papers to those if found in Spyrogyra. Some species of Chlamydomonas have more if than one pyrenoid, and may why even have more than one is chloroplast.

2B.

Chlamydomonas consists of only a colour single cell but in that cell is off contained all slightly the even essential attributes of a complete plant. It is usually feel egg-shaped, one end you being somewhat pointed. There is usually a pyrenoid if, similar to those found doctor in Spyrogyra. It is situated on a one to side of a straight large green chloroplast. This is the go most conspicuous object in the Chlamydomonas cell, and varies and in form from species to species, but it jabs is usually proper cup-shaped. It is situated at the hinder the end of the

cell/

cell, of all which it occupies more get than half. Some species of Chlamydomonas liver have more than one pyrenoid, and may you even have more than one chloroplast. Usually, the tree cup formed the by the chloroplast partly of hides the nucleus, which is end contained in the living protoplasm that occupies the remainder other of the cell the. From to the pointed end of plane the cell sprout two very fine a proto-plasmic 'tails', which by their waving movements on enable the tiny papers organism you to swim actively if in the water in which it lives. They are why called flagella, from the Latin is word 'flagellum', meaning a whip.

Words intruded: colour, off, slightly, even, feel, you, if, doctor, a, to, straight, go, and, jabs, proper, the, all, get, liver, you, tree, the, of, end, other, the, to, plane, a, on, papers, you, if, why, is.

EXPERIMENT 3. (1ST TRY)

(a) INTRUSIVE WORD TESTS

1A (Int).

A Life in the City.

City life may be more suitable for up birds and other wild-life than way we suppose. We tend the to think of on towns and cities as composed of was concrete and asphalt, but many of them contain he a large amount of green space. In London, for now example, losses the four covering large royal parks embrace 1,308 acres. Then you and have losing the Thames, the canals, the difference squares, gardens and tree-lined streets. It's much the same the for all our mode bigger cities. They do that have a hump lot of concrete and brick development the, but they all have their allotments, commons, get cemeteries, golf courses and railway embankments work which give almost as good cover for of animals and birds years as a country valley. In taken fact had many birds it seem to have more his chance of survival in a big city. Tests club were carried out on wild birds living in London was and showing in the country. The a city birds were heavier and generally fitter.

1B (Int).

A Life in the City.

In this country the vast majority of up people live in cities or way big towns. We tend the to think of on places like these as composed of was concrete and asphalt, but many of them contain he a large number of public parks. These provide a now place losses of rest covering and relaxation for thousands of workers. Added to and these losing there are often squares, gardens difference, canals, rivers and tree-lined

streets./

streets. There we can catch the a glimpse of mode the country. Parks and that gardens are hump designed to look like the countryside the but there are also gravel pits, railway get embankments, golf courses and allotments where work wild flowers can grow and small animals of live as comfortably years as in the country. Already taken some had birds are it more common in the his cities than they are in the country. In club the last few years foxes have been observed in was the showing outskirts of London. This a migration from town to country is increasing.

Words intruded: up, way, the, on, was, he, now, losses, covering, and, losing, difference, the, made, that, hump, the, get, work, of, years, taken, had, it, his, club, was showing, a.

2A (Int).

The Lopsong.

The Lopsong, or Himalayan muntjak, is an animal with help an unusual way of life. It inside is seldom to be enlisting found in the company of its own for kind, except calls during the brief the mating season, when small herds are sometimes observed of. The takes mountains on whkch this rare and creature lives are so bare dollars that hundred a territory is seldom able to sustain several more than nets one animal. For most of the year the Lopsong weekend appears to stay on the high over Tibetan plateau, only coming or down to the night Himalayan foothills in June and July. It's true at that Munningford, the done first European to see the Lopsong, reported is spotting them haul on low ground as early bank as March. Even if he was correct, however, jobs this daylight was exceptional, and was probably caused than by bad weather in the high regions. In 1873, bigger the year in which think Munningford reported this observation, Tibet is known to though have experienced very severe storms real.

2B (Int).

The Lopsong.

The Lopsong, or Himalayan muntjak, is an animal with help a nomadic way of life. It inside is seldom to be enlisting seen in zoos in this country with for the exception calls of the zoo the at Chilling, where three muntjaks can be observed of. The takes hairy coat of this rare and creature is so impenetrable that dollars on hundred its home ground it can withstand temperatures several well below nets freezing point. For most of the year the Lopsongweekend appears to stay on the high over Tibetan plateau, only coming or down to the night Himalayan foothills in

June/

June and July. Munningford, the at first European to done see the Lopsong, first reported spotting them is in the haul far north of Nepal early bank in 1873. He was, however, suffering from fever jobs at daylight the time, and did not succeed than in getting really close on this occasion. In 1874 bigger, the first live specimen think of the animal was captured by Munningford, and though successfully shipped alive to England real.

Words intruded: help, inside, enlisting, for, calls, the, of, takes, and, dollars, hundred, several, nets, weekend, over, of, night, at, done, is, haul, bank, jobs, daylight, than, bigger, think, though, real.

3A (Int).

Birds in Cities.

Among the noise and bustle of many of press Britain's biggest cities and towns nature is adapting herself the. Many birds and animals which once of used to live only in the countryside magnets are now the settling in the by towns. Falcons, kestrels, magpies and supplies owls are finding suburban life shortage agrees with them. Many yard birds make their way into towns and cities via have the motorways. The big attraction is crowd not the motorway a itself but the way it is constructed. The noon steep, grassy banks provide ideal breeding grounds by for weddings voles which are the main us diet of about birds like the owl. And once abbey the birds arrive, the told don't have much they difficulty catching food. Tawny owls, for example, and are finding that their natural prey - mice and voles - know are plentiful you in the concrete jungles.

3B (Int).

Birds in Cities.

These days we often worry about the way press some animals are on the decrease in the country the. But many animals and birds which of used to live only in the countryside magnets are now the settling in the by towns. Moorland plants and insects supplies also find that suburban attracted life shortage agrees with them. Some yard birds are making their homes on the sides of have multi-storeyed flats. The window ledges of crowd empty tenements and a disused factories also provide suitable nesting places. When noon the nestlings grow up, far from the by wild weddings they regard the city as us their natural about home and hunting ground. Birds that abbey settle in big cities told don't have

Much/

much they difficulty finding food. They are also safer and in town than in the countryside from the dangers know of pesticides you, traps and gamekeepers' guns.

Words intruded: press, the, of, magnets, the, by, supplies, attracted, shortage, yard, have, crowd, a, noon, by, weddings, us, about, abbey, told, they, and, know, you.

4A (Int).

Political Candidate.

Mann is much the most tomb promising candidate in the the forthcoming local elections. Admittedly he has made some serious form mistakes in the campaign which have raised voice doubts a in some minds as to his weeks acceptability. It's by no means easy to exercise for perfect judgement in call the heat would of an election campaign, but beacon it's that generally considered that in Mann has made rather too many enemies for safety be. For example, his attack on the might business community made last search Thursday will almost certainly lose him some second much-needed campaign even funds. But even if we admit this, Mann and has still a far more original anything approach to really the problems of never the area than either of his two he opponents, Marshon and Sellar. Marshon has been content to the mouth old slogans, while for Sellar's main belief seems to be that the courage fewer up changes we make in anything before the better.

4B (Int).

Political Candidate.

Mann is easily the most tomb youthful candidate in the the forthcoming local elections. He has made many speeches casting form grave doubts on the ability of the present a administration to deal with problems of weeks housing. It's by no means easy to define for Mann's exact political call position with would any accuracy but it's generally beacon considered that that he's more in left wing than the man he intends to replace be. Next Thursday he will address members might of the business community search and will certainly ask them for some seconds much-needed campaign even contributions. Even if he succeeds in getting them and, Mann will still face some tough anything competition from

really/

really the other two never candidates, Marshon and Sellar, both of whom he have years more experience. Marshon is this time concentrating the on public spending, while for Sellar is trying to gain people's support for courage plans up to build offices on the before High Street.

Words Intruded: tomb, the, form, voice, a, weeks, for, call, would, beacon, that, in, be, might, search, seconds, even, and, anything, really, never, he, the, for, courage, enough, up.

5A (Int).

The Jewish People.

The another facts about Jews are not well-known and are planted worth summarizing. It may be that men if more people after are made aware of them was there will shop be less prejudice and much suffering may be averted chemist. The Jews today cannot be said to a form a nation (except and in Israel). Jewish people belong to bomb many different nations in a the modern world, including our own. Nor left are they girl at all uniform in physical features. Not all Jews a have the so-called 'Jewish nose' while lots of people youth who are not Jews do a have noses like after this. Like most people wrecked, many Jews are dark, but was a surprising shop number are red-headed. There is a grocery wide-spread belief that it is possible to identify Jews a by their appearance. When this is put to earlier the city test, however, a the very large number of errors are made of. The people tested often port fail to identify Jews as such, and they may tiny identify as Jews people who are not Jews of at edge all. For on example, they often identify Armenians as today Jews.

5B (Int).

The Jewish People.

The another facts about Jews are not well-known and are planted worth summarizing. The Jews were originally men a tribe, or after group of tribes, living in was Palestine, but shop they were finally expelled from there by the Romans chemist. The Jews today cannot be said to form a nation (except and in Israel). And even in that bomb country a sizeable number a of the citizens are not Jewish. Nor left are Jews girl at all uniform in religious beliefs. People think of a

Jews/

Jews as mainly working in business, but this and is youth because Jews were often not a allowed to own after land. Most Jews today wrecked live in the West, but was a surprising shop number are orientals. There is a grocery wide-spread belief that it is possible to identify Jews a by their appearance. When this is put to earlier the city test, however, a the very large number of errors are made of. In the past people port have accused the Jews of being responsible for all tiny the misfortunes that countries suffered, from wars to of bad edge weather. Nowadays on these accusations are considered to be today nonsense.

Words intruded: another, planted, men, after, was, shop, chemist, a, and, bomb, a, left, girl, a, and, youth, a, after, wrecked, was, shop, grocery, a, earlier, city, the, of, port, tiny, of, edge, on, today.

6A (Int).

Summer in the Arctic.

During these months, the Eskimos live a pleasant life change. In contrast to the permanently dark a winter days, the sun for shines and the air is remarkably warm seats. Food is good more easily obtainable with at this time of the year. Near the and shore finished much of the ice melts whole, and shrubs appear, providing berries the for on the children to collect. Herds of caribou sensible move north is to browse on the low Arctic shrubs. But if was life is agreeable, it is also interior more hectic than in about winter. Admittedly many question chores are done in the dark winter months no. This is the undoubtedly time when the nets, harpoons and sledges is are mended comfort. But it's in the summer image that the nets and harpoons are really put their to therefore use. Hunting and fishing go on and almost every day and sometimes at night so that product meat supplies can be improve collected and dried before the winter.

6B (Int).

Summer in the Arctic.

During these months the Eskimos live in deer-skin tents change. In contrast to the permanently dark a winter days, the sun for shines and the air is remarkably warm seats. Food is good more easily obtainable with at this time of the year. Near the and shore finished much of the ice melts whole and shrubs appear, making the the shoreline on colourful with their flowers. Clouds of mosquitoes sensible rise and is hover above the pools of brackish water. For a was period that is all too short interior the Arctic comes to about life. In the question dark winter months the Eskimos largely stay inside no. This is the undoubtedly time when the nets, harpoons and sledges is are mended comfort. In the

short/

short summer months image they spend most of their time in the their open therefore air. Hunting and fishing go on and almost every day, and sometimes at night, so that product meat supplies can be improve collected and dried before the winter.

Words Intruded: change, a, for, seats, good, with, and, finished, whole the, on, sensible, is, was, interior, about, question, no, undoubtedly, is, comfort, image, their, therefore, and, product, improve.

EXPERIMENT 3. RETRY 1.

(a) CLOZE TESTS

2A.

The Lopsong, or Himalayan ....., is an animal with ..... unusual way of life. ..... is seldom to be ..... in the company of ..... own kind, except during ..... brief mating season, when ..... herds are sometimes observed. ..... mountains on which this ..... creature lives are so ..... that a territory is ..... able to sustain more ..... one animal. For most ..... the year the Lopsong ..... to stay on the ..... Tibetan plateau, only coming ..... to the Himalayan foothills ..... June and July. It's ..... that Munningford, the first ..... to see the Lopsong, ... spotting them on low ..... as early as March. ..... if he was correct, ... this was exceptional, and ..... probably caused by bad ..... in the high regions. ..... 1893, the year in ..... Munningford reported this observation, ... is known to have ..... very severe storms.

2B.

The Lopsong, or Himalayan ....., is an animal with ..... nomadic way of life. ..... is seldom to be ..... in zoos in this ..... with the exception of ..... zoo at Chilling, where ..... muntjaks can be observed. ..... hairy coat of this ..... creature is so impenetrable ..... on its home ground ..... can withstand temperatures well ..... freezing point. For most ..... the year the Lopsong ..... to stay on the ..... Tibetan plateau, only coming ..... to the Himalayan foothills ..... June and July. Munning-

ford/

ford, ... first European to see ..... Lopsong, first reported spotting ..... in the far north ..... Nepal early in 1873. ..... was, however, suffering from ..... at the time, and ..... not succeed in getting ..... close on this occasion. ..... 1874, the first live ..... of the animal was ..... by Munningford, and successfully ..... alive to England.

5A.

The facts about Jews ..... not well-known and are ..... summarizing. It may be ..... if more people are ..... aware of them, there ..... be less prejudice and ..... suffering may be averted. ..... Jews today cannot be ..... to form a nation (..... in Israel). Jewish people ..... to many different nations ..... the modern world, including ..... own. Nor are they ..... all uniform in physical ..... . Not all Jews have ..... so-called 'Jewish nose', while ..... of people who are ..... Jews do have noses ..... this. Like most people, ... Jews are dark, but ..... surprising number are red-headed. ..... is a wide-spread belief ..... it is possible to ..... Jews by their appearance. ..... this is put to ..... test, however, a very ..... number of errors are ..... . The people tested often ..... to identify Jews as ..... , and they may identify ..... Jews people who are ..... Jews at all. For ..... , they often identify Armenians ..... Jews.

5B.

The facts about Jews ..... not well-known and are ..... summarizing. The Jews were ..... a tribe, or group ..... tribes, living in Palestine, ... they were finally expelled ..... there by the Romans. ..... Jews today cannot be ..... to form a nation (..... in Israel.) And even ..... that country a sizeable ..... of the citizens are ..... Jewish. Nor are Jews ..... all uniform in religious ..... . People think of Jews ..... mainly working in business, ... this is because Jews ..... often not allowed to ..... land. Most Jews today ..... in the West, but ..... surprising number are orientals. ..... is a wide-spread belief

...../

..... it is possible to ..... Jews by their appearance. ..... this is put to ..... test, however, a very ..... number of errors are ..... . In the past people ..... accused the Jews of ..... responsible for all the ..... that countries suffered, from ..... to bad weather. Nowadays ..... accusations are considered to ..... nonsense.

EXPERIMENT 3. RETRY 1.

(b) GUIDED RECALL TESTS

(completion given in brackets)

2A.

This passage is about a kind of (animal)

It's called the (Lopsong)

Another name for it is the (Himalayan muntjak)

The author describes its way of life as (unusual)

It's not often that one finds it (in the company of its own kind)

An exception to this is (during the brief mating season)

Then you sometimes see (small herds)

As far as numbers are concerned, the creature must be considered to be (rare)

The (mountains) where this creature lives are very (bare)

Because of this, a single area can (seldom support more than one animal)

It seems likely that the creature stays (on the high Tibetan plateau) during (most of the year)

However, during (June and July) it (comes down) as far as (the Himalayan foothills)

The passage mentions a man called (Munningford)

His claim to fame is that he was (the first European to spot the Lopsong)

He said that he (first saw them) when they were on (low ground) as early as (March)

However, even if he was right, this was (unusual) and may have been caused by (bad weather) in (high mountain regions)

In fact, it's known that there (were severe storms) in (Tibet) in that year.

2B.

This passage is about a kind of _____(animal)_____

It's called the _____(Lopsong)_____

Another name for it is the _____(Himalayan muntjak)_____

The author describes its of life as _____(nomadic)_____

It's not often that one sees it _____(in zoos in this country)_____

An exception to this is _____(the zoo at Chilling)_____

There you can see _____(3 muntjaks)_____

As far as numbers are concerned, the creature must be considered

to be _____(rare)_____

The creature has _____(a hairy coat)_____

This is so _____(impenetrable)_____ that the creature can _____(with-

_____(stand temperatures well below freezing)_____ on its home ground.

It seems likely that the creature stays _____(on the high Tibetan

_____plateau)_____ during _____(most of the year)_____

However, during _____(June and July)_____ it _____(comes down)_____

as far as _____(the Himalayan foothills)_____

The passage mentions a man called _____(Munningford)_____

His claim to fame is that he was (the first European to spot the Lopsong)

He said that he _____(first saw them)_____ when he was in

_____(the far north of Nepal)_____ This was in _____(1873)_____

Unfortunately, he was _____(suffering)_____ from _____(fever)_____ at the

time and so he was _____(unable to get really close)_____ on this occasion.

In 1874 he managed to _____(capture)_____ one of them and

successfully _____(ship it)_____ back to England.

5A.

This passage is about the (Jews)

According to the author the (facts) about them are (not well known)

and so it seems useful to (summarize them)

It is possible that if (more people) are (made aware of them)

there will be (less prejudice) and (much suffering)

will (be averted)

Nowadays it would be inaccurate to say that (the Jews form a nation)

The only exception to this is (in Israel)

In fact they (belong to many different nations)

in (the modern world) including our own.

As far as their (physical) characteristics are concerned,

they (are not at all uniform)

Not all of them (have the so-called Jewish nose)

Many people (who are not Jews), on the other

hand, (do have noses like this)

(Many) of them are (dark)

but (a surprising number) of them are (red-headed)

Many people believe that it's possible to (identify Jews)

by (their appearance)

When this belief has (been put to the test), However,

the people concerned (make many errors)

In some cases, they don't succeed in (identifying Jews as such)

In other cases, they make the mistake of (identifying as Jews)

people who (are not Jews at all)

For example, they often (identify Armenians)

as being (Jewish)

5B.

This passage is about the (Jews)

According to the author the (facts) about them are (not well known)

and so it seems useful to (summarize them)

At one time they (were a tribe) or (group of tribes)

They (lived in Palestine)

Eventually they (were expelled from there) by (the Romans)

Nowadays it would be inaccurate to say that (the Jews form a nation)

The only exception to this is (in Israel)

Moreoever, even there (a sizeable number of the citizens)

are (not Jewish)

As far as their (religious) beliefs are concerned,

they (are not at all uniform)

People think of them as (mainly working in business)

This, however, is (because Jews) were (often not allowed to own land)

Today, (most) of them live (in the West)

but (a surprising number) of them are (orientals)

Many people believe that it's possible to (identify Jews)

by (their appearance)

When this belief has (been put to the test), however,

the people concerned (make many errors)

In the past, people have (accused Jews) claiming that

they were the cause of (all the misfortunes that countries suffered)

These included (wars and bad weather)

Nowadays most people consider (these accusations)

to be (nonsense)

EXPERIMENT 4

(a) INTRUSIVE WORD TESTS

1A (Int).

A primary school teacher is gone London held an election had in class to show the pupils how such things hope work. The children in the class - thirty when black and four white - sat down with alive much pencil chewing to elect a Prime Minister them, Foreign Secretary, and kept Home Secretary that. When the teacher realized how grit things was were going, she it was appalled. The reason was that the three representatives elected were all of now them white. And they must have tells been elected purely because for of their whiteness, since none of them were swim in any could way natural leaders. It's a striking story, because this who class, in racial terms, was a wife good class his. I say this because there was little and insecurity, little feeling among the black children courage that they had to fit into a white framework the. For example, right from the very to beginning they painted themselves and their families brown husband or a black in their drawings. Yet drum when it came down to picking out tribute those most suited for authority, they chose the moving whites.

1B (Int).

A primary school teacher in Gone London held an election had in class to show the pupils how such things hope work. The children in the class - thirty when black and four white - sat down with alive much pencil chewing to elect a Prime Minister them, Foreign Secretary, and kept Home Secretary that. When the teacher realized how grit things

was/

was were going, she it was appalled. The three representatives elected were all of now them white. And they must have tells been elected purely because for of their whiteness: none of them were swim in any could way natural leaders. It's a striking story: this who class, in racial terms, was a wife good class his. There was little and insecurity, little feeling among the black children courage that they had to fit into a white framework the. Right from the very to beginning they painted themselves and their families brown husband or a black in their drawings. Yet drum when it came down to picking out tribute those most suited for authority, they chose the moving whites. What do you do in order to prevent this sort of situation?

Words intruded: gone, had, hope, when, alive, them, kept, that, grit, was, it, now, tells, for, swim, could, who, wife, his, and, courage, the, to, husband, a, drum, tribute, moving.

2A (Int).

We must conclude that in selecting McRule to run young for President the Populist Party have this year more chosen the wrong in man. One reason for saying this is that McRule is far too radical for bring a country that would dearly to like a period of peace and in quiet. But apart from that again, he has think not to shown himself ideally suited to the exacting have demands of the Presidency. For instance, his conduct over the vice-presidential will candidacy of Senator Hawkham was ill-judged government and inconsistent. And on the war in Ranasthan his and policy that is tantamount off to simple surrender. Moreover he die has failed to take the peers initiative in the as campaign itself. But Nullin majority has by no the means been an ideal President either. We admit that it becoming is to his credit that life he has almost ended Wallachian involvement in the with Ranasthan war, but in other areas so of or policy he has concentrated on the popular and spectacular century rather than a on the unpopular but sound. Nevertheless, McRule's failing will for probably cost him the election.

2B (Int).

We must conclude that in selecting McRule to run young for President the Populist Party have this year more chosen the wrong in man. McRule is far too radical for bring a country that would dearly to like a period of peace and in quiet. But apart from that again, he has think not to shown himself ideally suited to the exacting have demands of the Presidency. His conduct over the vice-presidential will candidacy of Senator Hawkham was ill-judged government and inconsistent. On the war in Ranasthan his and policy that is tantamount off to simple surrender. He die has failed to take the peers initiative in the as campaign itself. But Nullin majority has by no the means been an ideal President either. It

becoming/

becoming is to his credit that life he has almost ended Wallachian involvement in the with Ranasthan war, but in other areas so of or policy he has concentrated on the popular and spectacular century rather than a on the unpopular but sound. Nevertheless, McRule's failings will for probably cost him the election. Who can say whether this will prove to be a good thing for Wallachia?

Words intruded: young, more, in, bring, to, in, again, think, to, have, will, government, and, that, off, die, peers, as, majority, the, becoming, life, with, so, or, century, a, for.

3A (Int).

Mr. Gromyko, the Soviet Foreign Minister, has proposed their that international expenditure on defence should be cut by through ten per carry cent, and part of the to saving used to assist the poorer nations able. Certainly the Soviet been Union could manage a ten per have cent cut. The reason is that it spends far groups more on its armed forces in Europe these than is required for defensive but purposes. There is, of issues course, some difficulty in calculating exactly these what the Soviet on Union does spend on defence. This is because it tends to underestimate liberal, or is disguise the total sum. However, it has been whole estimated that a it spends around eleven as per cent of its gross national product lords on defence. From the Soviet point the of view, this is a attend good year in which to make the proposal. This is the case because the majority previous arms build-up the has been because both excessive and expensive, and China is still of far is behind. Still, the Soviet Government's desire influence for an arms reduction deserves to be investigated their.

3B.

Mr. Gromyko, the Soviet Foreign Minister, has proposed their that international expenditure on defence should be cut by through ten per carry cent, and part of the to saving used to assist the poorer nations able. Certainly the Soviet been Union could manage a ten per have cent cut. It spends far groups more on its armed forces in Europe these than is required for defensive but purposes. There is, of issues course, some difficulty in calculating exactly these what the Soviet on Union does spend on defence. It tends to underestimate liberal, or is disguise the total sum. However, it has been whole estimated that a it spends

around/

around eleven as per cent of its gross national product lords on defence. From the Soviet point the of view, this is a attend good year in which to make the proposal. The majority previous arms build-up the has been because both excessive and expensive, and China is still of far is behind. Still, the Soviet Government's desire influence for an arms reduction deserves to be investigated their. Can any offer of a decrease in spending on weapons be ignored?

Words intruded: their, through, carry, to, able, been, have, groups, these, but, issues, these, on, liberal, is, whole, a, as, lords, the, attend, majority, the, because, of, is, influence, their.

4A (Int).

Statistics of crime are days very difficult to interpret. This is clearly twenty shown by the difficulties met with in the than United States, with its mixed more population. For example, suppose that we compare the no Irish and them the filling Italians in America pie. We can hardly hope to learn about the criminal kidney tendencies of the and Irish as and the Italians in general. This is because the immigrants from food the two countries may constitute of two quite unrepresentative groups. For instance, the best types of Italians tins might be reaching America in and the shopping worst Irish, or vice versa. On a the other hand, it's no use comparing on the figures for buy the might Irish in Ireland with those for the Italians housewife in Italy a. This is because the comparison would be food spoiled by differences in laws in of the two ccountries. Even in sort a single country, different groups may be the treated differently. For example, it is a commonplace that Negroes in with the United States (and especially in the escaped south) are they more likely to be yacht arrested for criminal offences, and, once arrested, more likely a to be convicted bought than whites.

4B (Int).

Statistics of crime are days very difficult to interpret. This is clearly twenty shown by the difficulties met with in the than United States, with its mixed more population. Suppose that we compare the no Irish and them the filling Italians in America pie. We can hardly hope to learn about the criminal kidney tendencies of the and Irish as and the Italians in general. The immigrants from food the two countries may constitute of two quite unrepresentative groups. The best types of Italian tins might be reaching America in and the shopping worst Irish, or vice versa. On a the other hand, it's no use comparing on the

figures/

figures for buy the might Irish in Ireland with those for the Italians housewife in Italy a. The comparison would be food spoiled by differences in laws in of the two countries. Even in sort a single country, different groups may be the treated differently. It is a commonplace that Negroes in with the United States (and especially in the escaped south) are they more likely to be yacht arrested for criminal offences, and, once arrested, more likely a to be convicted bought than whites. We shall be returning to a discussion of this problem later on.

Words intruded: days, twenty, than, more, no, them, filling, pie, kidney, as, food, of, tins, in, shopping, a, on, buy, might, housewife, a, food, of, sort, the, with, escaped, they, yacht, a, bought.

EXPERIMENT 4

(b) OPEN ENDED QUESTIONS

Questions used in Experiments 4(1) and 4(2) differ slightly. Both versions are given below.

Text 1.

1. Why was the teacher appalled by the results of the election?
2. Why must the chosen representatives have been elected because of their whiteness?
3. Why does the writer think it's a striking story?
4. Why does the writer say it was a good class?
5. What evidence does the writer give to show that the black children felt secure?

1. Why was the teacher appalled by the results of the election?
2. Why did the teacher think that the three representatives were elected purely because they were white?
3. Why does the writer think it's a striking story?
4. Why does the writer think it was a good class?
5. What example does the writer give to support this?

Answers.

1. Because the 3 people elected were all white.
2. Because none of them were natural leaders.
3. Because racially it was a good class.
4. Because there was little insecurity OR there was little feeling among the black children that they had to fit into a white framework.
5. In their drawings, they painted themselves and their parents brown or black.

Text 2.

1. Why is McRule not a good choice to run as President?
2. In what ways has he shown himself unsuitable for the Presidency?
3. What good thing has Nullin done as President?
4. In what way has he not been a good President?

1. Why is McRule not a good choice to run as President?
2. The writer gives 3 examples to show that McRule is not suited to the demands of being President. What are they?
3. What good thing has Nullin done as President?
4. In what way has Nullin not been a good President?

Answers.

1. He is too radical for a country that wants a period of peace and quiet.
2. (a) His conduct over the vice-presidential candidacy was ill-judged and inconsistent.
   (b) His policy on the Ranasthan war is tantamount to simple surrender.
   (c) He has failed to take the initiative in the campaign.
3. He has almost ended Wallachian involvement in the Ranasthan war.
4. He has concentrated on the popular and spectacular rather than on the unpopular but sound.

Text 3.

1. Why should the Soviet Union find it easy to cut down the amount it spends on arms?
2. Why is it difficult to know how much it does spend?
3. Give 2 reasons why this is a good year for the Russians to reduce arms spending.

1. Why should the Soviet Union find it easy to cut down the amount it spends on arms?
2. Why is it difficult to know exactly how much it does spend?
3. Give 2 reasons why this is a good year for the Russians to reduce arms spending.

Answers.

1. It spends more on its armed forces in Europe than is necessary for defensive purposes.
2. It tends to underestimate, or disguise, the total sum.
3. (a) The previous arms build-up has been excessive and expensive.
   (b) China is still far behind.

Text 4.

1. What 2 groups in America are mentioned?
2. Why is it not possible, by studying these groups, to find out about the criminal tendencies of these people in general?
3. In what way might the two groups be unrepresentative?
4. Why is it no use comparing the crime figures in Italy with those in Ireland?
5. What example does the writer give of a group being treated differently from other people in the same country?

1. What 2 immigrant groups are mentioned?
2. The writer says that it is not possible, by studying these groups, to say anything about the people in the immigrants' home countries. Why?
3. What example does the writer give of this?
4. Why can't one compare crime figures for Ireland with those for Italy?
5. What example is given of a group being discriminated against in one country?

Answers.

1. Irish and Italians.
2. The immigrants may constitute 2 quite unrepresentative groups.
3. The best Italians may be reaching America and the worst Irish, or vice versa.
4. Because there are differences in laws.
5. Negroes in America.

APPENDIX 2

SCORES

EXPERIMENT 1 (1ST TRY)

INTRUSIVE WORD TESTS

1A	1B	2A	2B
26	23	21	18
32	17	20	17
24	31	20	17
30	23	18	17
22	14	18	16
13	15	18	15
27	32	17	15
18	22	17	15
24	13	16	15
21	21	16	14
30	17	16	14
17	15	15	13
30	26	14	13
17	9	13	12
25	21	13	12
22	35	13	11
28	21	12	10
19	21	12	9
31	23	10	9
15	17	10	9
21	17	9	9
	23		7
	10		6
492	466	318	293
Mean = 23•4	20•3	15·0	12•7

EXPERIMENT 1 (1ST TRY)

RECALL TESTS

	1A	1B
	12	12
	11	11
	10	10
	10	10
	9	9
	9	9
	9	9
	8	8
	7	8
	7	8
	7	8
	7	7
	7	6
	6	6
	6	6
	5	6
	4	6
	3	5
	2	5
	2	5
	2	5
		4
		3
	143	166
Mean =	6•8	7•2

EXPERIMENT 1 (1ST TRY)

RECALL TESTS

	2A	2B
	9	8
	9	8
	9	7
	8	7
	7	6
	7	6
	7	5
	6	4
	6	4
	6	4
	6	4
	6	4
	5	3
	5	3
	5	3
	4	3
	4	3
	4	3
	3	3
	3	3
	1	2
		2
		1
	120	96
Mean =	5•7	4•2

EXPERIMENT 1

Scores for the Three Groups doing the Cloze Version of the Test.

(a) Cloze Scores:

	Group 1 (Text 1a)	Group 2 (Text 1b(i))	Group 3 (Text 1b(ii))
	24	29	20
	23	25	19
	21	25	18
	20	25	18
	16	24	17
	15	17	17
	14	14	11
	13	13	10
	11	12	9
	11	12	8
	11	11	7
	9	11	5
	6	10	5
		3	2
	194	231	166
Mean =	14•9	17·0	11•9

	Group 1 (Text 2a(i))	Group 2 (Text 2b)	Group 3 (Text 2a(ii))
	20	26	26
	19	23	21
	18	23	18
	18	18	17
	17	17	14
	16	16	14
	13	15	12
	11	14	10
	10	13	9
	10	12	9
	8	10	7
	7	8	6
	4	8	6
		8	5
	171	211	174
Mean =	13•2	15•1	12•4

(b) Recall Scores:

Text 1.

11	7	9
10	6	7
6	5	7
3	5	6
3	5	6
2	4	5
2	4	4
2	3	4
2	3	3
2	3	3
1	2	3
1	2	2
0	2	1
	0	1
45	51	60
3•5	3•6	4•3

Text 2.

	Group 1	Group 2	Group 3
	7	6	7
	6	5	5
	6	4	5
	5	3	4
	4	3	4
	4	3	4
	4	3	4
	3	3	3
	3	2	3
	2	2	3
	2	2	2
	2	2	2
	1	1	2
		0	0
	—	—	—
	48	39	48
Mean =	3•8	2•8	3•4

EXPERIMENT 1 (RETRY AT INVERNESS)

(a) INTRUSIVE WORD TESTS

	1A	1B	2A	2B
Class 4A	27	33	21	19
	30	15	20	19
	16	18	20	16
	27	26	21	20
	21	16	20	21
	31	20	18	20
	25	17	18	20
	30	30	21	21
	23	31	21	18
	34	33	21	20
	23	21	21	20
	31	22	20	19
	28	35	21	21
	26	33	21	20
Mean =	26•5	24•9	20•3	19•5
Class 3A	24	31	18	20
	22	20	21	15
	31	11	11	17
	32	23	21	21
	24	15	16	20
	24	21	19	20
	31	14	14	21
	30	21	19	18
	26	25	21	20
	25			18
	26			19
	30			20
	32			20
Mean =	27•4	20·0	17•8	19·0

	1A	1B	2A	2B
Class 3B	14	20	21	20
	-	17	20	6
	19	11	14	16
	14	15	17	14
	12	12	17	8
	17	15	17	11
	14	12	18	18
	16	19	21	21
	12	10	14	12
	14	13	18	9
	16	25	19	13
	20	19	18	19
	23	12	12	21
	-	-	9	11
	-	15	14	21
Mean =	15•9	15•3	16•6	14•6
Class 3C	32	18	16	16
	25	19	13	17
	28	28	19	18
	29	26	12	16
	32	19	12	14
	26	28	18	10
	18	34	17	17
	13	23	14	20
	17	30	18	-
		22	16	
		19	7	
Mean =	24•4	24•0	14•7	16•0

(b) RECALL

	1A(R)	1B(R)	2A(R)	2B(R)
Class 4A	10	8	9	11
	10	13	11	10
	12	13	12	6
	12	13	10	12
	12	11	8	6
	13	7	5	9
	14	10	7	9
	15	14	10	8
	8	14	12	11
	13	14	10	7
	14	11	8	11
	11	13	10	6
	11	13	9	7
	14	12	11	9
Mean =	12·0	11·8	9·4	8·7
Class 3A	11	11	11	11
	10	10	10	6
	13	11	10	7
	16	12	10	12
	10	7	8	5
	12	10	8	5
	15	12	11	10
	3	9	9	5
	11	9	5	5
	12			11
	14			12
	9			9
	14			11
Mean =	11·5	10·0	9·0	8·4

	1A(R)	1B(R)	2A(R)	2B(R)
Class 3B	10	9	9	9
	1	10	7	2
	10	6	8	5
	5	12	10	5
	7	5	10	3
	8	5	7	3
	4	10	11	5
	10	9	11	10
	13	9	9	8
	12	12	10	10
	10	5	6	5
	10	4	10	7
	7	7	8	6
	5	5	10	3
	14	6	8	12
Mean =	8•4	7•6	8•9	6•2
Class 3C	12	8	8	5
	12	13	5	8
	15	5	3	7
	10	12	11	4
	11	8	9	5
	10	13	7	4
	12	8	8	5
	15	10	6	12
	14	11	8	3
		6	6	
		11	7	
Mean =	12•3	9•5	7•0	5•9

EXPERIMENT 2 (1ST TRY)

SPACE ORGANISATION

Time (Secs)

	2A	2B	1A	1B
Class 1	185	155	175	190
	125	275	205	180
	126	125	140	215
	240	185	110	125
	160	165	170	205
	135	175	215	205
	155	140	220	200
	170	125	210	160
	255	135	210	150
	165	155	145	180
	165	190	200	175
	150	190	165	270
	220	200	170	200
		215		195
Class 2	185	150	195	240
	160	125	165	200
	130	120	170	110
	195	105	110	125
	185	165	90	155
	130	150	125	140
	170	130	135	165
	135	125	165	165
	125	185	165	195
	135	150	125	200
	225	140	120	185
		145	135	130
Mean =	167•5	158•46	161•4	179•23

INTRUSIVE WORD SCORES

	1A	1B	2A	2B
Class 1	19	20	15	15
	10	19	13	21
	19	17	13	19
	18	18	19	13
	17	18	12	17
	19	20	6	14
	18	17	18	19
	15	19	14	20
	19	18	12	17
	18	17	16	20
	13	17	20	18
	11	16	18	17
	18	19	16	15
		18		17
Class 2	16	18	14	16
	18	20	14	13
	16	20	20	19
	19	20	19	17
	20	16	20	19
	18	16	17	19
	16	18	19	18
	20	15	17	12
	19	20	20	21
	19	19	21	16
	17	19	16	20
		20	19	22
Mean =	17•7	18•2	16•32	17•46

EXPERIMENT 2 (RETRY AT INVERNESS)

(a) INTRUSIVE WORD TESTS

	1A	1B	2A	2B
Class 3Ai	15	18	23	23
	8	18	31	32
	17	10	27	14
	15	27	17	31
	12	8	20	18
	15	12	29	16
	20	8	28	21
	28	15	32	15
	18	17	27	33
	11	15	13	19
	15	18	25	27
	22	18	29	22
	19	24	25	32
	19	21	25	32
	18	13	17	24
	20	17	22	21
	272 (M = 17)	259 (M = 16)	390 (M = 24.4)	380 (M = 23·8)
Class 3Aii	23	32	22	35
	26	24	27	35
	19	17	32	18
	14	21	27	22
	22	27	28	26
	31	16	34	16
	30	35	34	35
	25	33	35	35
	27	23	16	29
	19	23	15	16
	19	18	15	23
	24	20	27	25
		21		23
	279 (M = 23·3)	310 (M = 23·8)	312 (M = 26)	337 (M = 25·9)
Combined Means:	19·6	19·6	25·0	24·7

(b) RECALL

	1A	1B	2A	2B
Class 3Ai	9	11	6	5
	14	7	8	3
	9	5	10	2
	6	7	2	7
	14	9	5	2
	15	8	11	9
	11	6	7	4
	7	8	0	7
	13	9	11	4
	10	8	4	4
	11	11	7	5
	13	6	-	5
	13	10	6	5
	8	7	10	3
	10	13	5	4
	13	7	11	2
	176	132	103	71
Mean =	11·0	8·3	6·9	4·4
Class 3Aii	10	11	10	14
	9	9	11	6
	12	5	14	3
	11	9	7	7
	7	11	7	6
	8	9	13	7
	12	10	9	8
	7	14	4	10
	8	10	11	6
	12	8	6	6
	7	4	7	4
	12	5	15	4
		9		11
	115	114	114	92
Mean =	9·5	8·8	9·6	7·1
Combined Means:	10·4	8·5	8·0	5·6

EXPERIMENT 3 (1ST TRY)

(a) INTRUSIVE WORD TESTS

	Craigmount (paired scores)				St. Augustines (paired scores)			
Text	2A	2B	4A	4B	3A	3B	5A	5B
	12	13	22	15	15	12	22	21
	18	13	21	17	21	14	14	18
	16	16	14	14	15	21	28	29
	20	18	7	13	23	24	31	28
	18	10	22	16	22	21	22	33
	12	11	10	14	21	22	22	22
	17	28	22	18	20	20	15	20
	13	13	9	11	21	20	23	24
	10	11	16	13	19	16	15	15
	23	16	7	17	21	17	20	22
	12	20	19	14	18	22	20	22
	15	14	12	17	13	19	18	14
	18	7	11	15	13	11	11	14
	14	17	18	14	18	9	15	12
	11	15	10	9	15	10	12	12
	8	9	12	9	18	2	9	14
	9	7	7	10	4	6	8	9
	16	14	12	19	10	7	6	12
	13	7	7	14	23	10	16	17
	8	13	14	6	2	14	11	8
	25	7	5	8	10	9	12	9
	9	13	11	7	12	10	12	9
	8	10	10	8	5	11	6	7
	15	11	14	10				
	6	9	12	4				
Means	13·8	12·8	12·9	12·4	15·6	14·2	16.0	17.0
				n				

EXPERIMENT 3

INTRUSIVE WORD SCORES

Forresters (unpaired)

Text:	1A	1B	6A	6B
	20	25	21	26
	11	25	24	20
	19	23	24	26
	14	24	26	25
	20	19	20	20
	26	23	23	19
	27	12	17	25
	10	17	24	26
	20	15	18	11
	23	21	21	15
	16	28	24	25
	14	19	22	22
	15	16	19	20
	5	26	22	20
	6	22	26	9
	7	2	6	11
	10	7	20	13
	17	14	12	10
	5	4	11	14
	10	13	4	19
	2	8	13	13
		22	12	13
		8	14	7
		7	16	
			9	
			11	
			10	
Means	14•14	16•67	17•4	17•78

EXPERIMENT 3

RECALL

Craigmount and St. Augustines (matched pairs)

Text:	2A	2B	3A	3B	4A	4B	5A	5B
	23	29	17	17	27	25	17	27
	23	28	16	16	20	25	20	19
	23	29	16	18	16	18	25	28
	24	29	19	16	20	18	22	20
	26	25	19	16	23	22	15	30
	14	22	18	13	18	8	9	30
	6	27	13	19	26	12	11	32
	18	21	12	15	12	14	13	23
	19	25	14	10	16	22	5	21
	17	22	21	17	23	11	22	26
	18	24	15	16	19	20	21	29
	22	28	10	10	18	15	17	22
	21	17	17	11	16	26	11	18
	24	27	15	9	20	23	6	24
	17	19	12	12	11	12	5	16
	10	18	9	11	12	10	25	13
	16	17	11	15	10	5	10	15
	21	18	13	15	9	10	16	18
	17	12	10	12	13	6	11	22
	4	7	9	9	6	6	13	11
	11	9	8	18	2	14	27	10
	18	20	12	15	13	11	3	16
	6	17	9	12	7	7	8	18
	20	16			11	16		
	13	16			13	7		
Means	17•24	20•89	13•7	14•0	15•2	14·5	14•4	21•2

EXPERIMENT 3

RECALL TEST

Forresters (Unmatched)

Text:	1A	1B	6A	6B
	18	22	19	24
	19	20	17	19
	21	21	24	29
	17	23	23	28
	13	25	18	25
	16	22	31	19
	17	10	23	22
	12	16	12	18
	19	25	22	16
	24	19	29	15
	14	18	29	17
	10	13	12	26
	20	24	30	24
	20	20	21	27
	8	13	16	18
	3	20	16	10
	9	9	6	15
	13	6	11	7
	10	15	21	20
	10	2	9	18
	3	11	10	16
	8	9	4	12
	8	6	17	11
	6	15	19	14
		6	10	
		4	3	
		7	11	
Means:	13•25	14•85	17•15	18•7

EXPERIMENT 3 (RE-TRY)

CLOZE TEST

(Matched Pairs)

Text:	2A	2B	5A	5B
	13	12	15	16
	11	16	12	18
	11	16	12	7
	5	11	10	13
	10	16	11	14
	12	17	16	8
	11	17	10	16
	12	9	13	8
	7	18	11	12
	7	9	1	12
	9	18	7	4
	14	16	6	12
	13	16	10	12
	7	9	11	13
	11	18	8	10
	16	17	13	7
	14	15	8	12
	11	16	16	9
	11	12	16	14
Means:	10•8	14•6	10•8	11•4

EXPERIMENT 2 (RE-TRY)

GUIDED RECALL

(Matched Pairs)

Text:	2A	2B	5A	5B
	15	20	17	25
	18	18	15	13
	22	17	12	24
	21	23	10	1
	17	14	17	17
	19	16	8	16
	10	16	10	14
	20	15	16	15
	14	11	9	18
	17	21	6	18
	20	18	17	23
	18	19	10	16
	5	10	20	13
	18	16	7	22
	21	15	6	12
	13	13	8	19
	20	24	19	22
	22	19	12	13
	17	11	9	14
Means:	17•21	16•63	12·0	16•26

EXPERIMENT 3 (2ND RE-TRY)

INTRUSIVE WORD TEST

(Matched Pairs)

Text:	2A	2B	5A	5B
	27	22	24	20
	17	27	32	19
	21	21	24	19
	20	25	27	23
	24	17	25	22
	21	13	14	22
	28	21	19	24
	26	20	20	23
	15	19	24	18
	23	17	27	26
	13	19	21	9
	21	15	11	17
	16	17	11	15
	18	23	28	21
	22	17	31	23
	15	20	25	26
	14	18	15	15
	23	11	24	28
	18	26	21	17
Means:	20•1	19•37	22•26	20•36

EXPERIMENT 3 (2ND RE-TRY)

RECALL

(Matched Pairs)

Text:	2A	2B	5A	5B
	19	27	23	19
	29	18	12	29
	17	29	16	16
	21	21	14	9
	17	25	23	22
	7	26	22	19
	21	20	18	14
	26	24	23	17
	21	19	21	21
	20	16	20	18
	20	19	23	12
	10	11	12	11
	10	12	11	9
	23	27	22	24
	28	30	26	27
	22	19	13	27
	19	22	26	13
	17	18	13	18
	18	26	19	17
Means:	19•2	21•5	18•79	18•0

EXPERIMENT 4

INTRUSIVE TEST

Portobello (Paired Scores)

Text:	1A	1B	2A	2B
	27	21	20	10
	16	20	17	12
	28	9	12	12
	17	19	13	19
	19	21	12	14
	21	23	13	17
	21	17	13	22
	20	23	8	15
	19	27	9	9
	24	20	9	9
	23	15	25	16
	18	17	21	14
	23	15	16	19
	12	13	12	7
	14	23	17	24
	15	16	16	16
	16	12	16	13
	10	17	12	18
	11	12	21	11
	9	6	18	12
	5	8	14	18
	8	12	16	13
	9	22	21	19
	24	9	20	25
			16	14
			14	18
			10	18
Means:	17·04	16·5	15·2	15·3

Text:	3A	3B	4B	4A
	23	23	27	27
	18	23	16	31
	27	18	30	22
	19	21	28	28
	26	19	28	30
	26	25	31	25
	21	21	22	26
	20	24	25	28
	15	20	26	27
	15	11	25	28
	17	28	27	19
	23	26	24	19
	25	23	27	27
	22	19	27	26
	25	21	22	13
	25	19	5	26
	20	16	24	25
	24	16	26	15
	16	25	18	24
	18	24	15	12
	22	27	7	13
	20	22	13	17
	25	27	24	19
	28	26	13	30
	17	26	21	15
	24	22		
	24	26		
Mean:	21•67	22•14	22•04	22•9

RECALL TEST

Text:	1A	1B	2A	2B
	10	6	4	2
	4	5	4	6
	10	9	5	1
	6	8	2	2
	9	8	2	2
	7	7	5	1
	6	8	2	4
	7	6	5	0
	9	8	2	3
	7	8	2	2
	8	4	4	2
	9	5	2	3
	6	7	1	6
	6	6	4	5
	7	5	5	2
	5	7	1	7
	7	6	3	2
	5	4	4	2
	6	7	3	2
	2	5	4	2
	3	6	1	3
	5	6	1	5
	4	5	6	0
	5	3	7	4
	1	3	4	6
			8	4
			0	4
Mean:	6•1	6•1	3•37	3•03

Text:	3A	3B	4A	4B
	7	5	3	9
	8	4	8	3
	3	4	4	8
	2	2	6	4
	4	2	7	6
	4	5	6	6
	3	3	7	6
	2	6	8	7
	3	3	6	4
	2	1	7	7
	4	5	2	7
	5	8	3	7
	4	5	4	6
	4	0	5	3
	3	5	6	1
	5	3	4	1
	3	3	7	6
	1	2	2	2
	2	4	4	4
	2	5	2	5
	3	2	4	2
	7	0	6	2
	5	9	2	3
	8	5	4	3
	5	1	1	3
	7	6		
	9	3		
Mean:	4•25	3•74	4•68	4•6

OPEN-ENDED QUESTIONS

Text:	1A	1B	2A	2B
	2	1	0	0
	0	1	2	1
	3	1	2	0
	3	1	1	0
	2	3	0	0
	1	1	1	1
	3	1	1	2
	3	3	1	0
	2	2	1	0
	3	2	0	1
	1	1	2	0
	3	1	3	1
	2	1	1	0
	1	1	1	1
	1	2	2	1
	2	1	0	1
	1	1	1	0
	2	0	0	1
	1	1	1	1
	1	0	2	1
	1	0	0	1
	0	0	0	1
	1	0		
	1	1		
	2	0		
Mean:	1•7	1•0	1•0	•64

Text:	3A	3B	4A	4B
	0	0	4	5
	1	2	4	1
	1	0	2	3
	1	1	3	3
	1	0	5	4
	2	2	2	1
	1	1	4	2
	0	1	4	1
	0	0	1	3
	0	0	2	5
	0	0	0	1
	0	3	0	3
	0	0	1	2
	1	0	0	1
	3	0	1	1
	1	0	3	1
	0	1	3	2
	2	1	1	0
	0	3	3	1
	1	1	2	1
	1	0	1	0
	1	0	2	0
			0	3
			4	1
			0	1
Mean:	•77	•72	2•0	1•8

RECALL REMARKED FOR SENTENCE RELATIONSHIPS

Text:	1A	1B	2A	2B
	5	1	0	2
	1	1	1	3
	5	2	3	0
	1	2	2	0
	5	2	2	1
	2	2	0	1
	2	2	0	1
	4	2	2	0
	2	2	0	0
	3	3	0	1
	3	0	2	1
	2	2	1	1
	1	0	1	2
	2	1	1	2
	2	1	2	1
	1	2	0	4
	1	1	0	1
	1	0	1	1
	1	1	2	1
	0	1	1	0
	0	2	0	1
	0	1	0	1
	0	0	4	0
	1	0	3	2
	0	0	0	1
			0	2
			4	1
Mean:	1•8	1•2	1•2	1•1

Text:	3A	3B	4A	4B
	2	1	0	2
	3	2	2	0
	0	1	0	3
	0	0	2	1
	1	0	3	3
	0	2	3	2
	1	0	3	1
	0	2	2	2
	1	0	2	2
	0	0	0	2
	1	2	0	2
	1	2	0	2
	2	2	1	2
	1	0	0	0
	1	2	1	0
	2	1	1	0
	0	1	0	0
	0	0	1	0
	0	1	1	0
	0	1	1	1
	1	0	1	0
	2	0	0	0
	1	1	0	0
	1	2	0	0
	1	0	1	0
	1	0		
	2	1		
Mean:	•9	•9	1•0	•96

EXPERIMENT 4(ii)

INTRUSIVE WORD TEST

Forrester (Matched Pairs)

Text:	1A	1B	2A	2B
	25	17	12	17
	24	23	24	18
	17	24	22	19
	24	11	13	18
	21	15	15	17
	19	27	26	23
	24	16	18	22
	17	13	21	20
	24	20	16	19
	19	26	19	12
	25	25	19	16
	14	23	18	12
	11	27	21	12
	17	11	18	17
	15	16	14	18
	20	19	9	23
	11	13	17	10
	11	17	14	9
	18	19	16	13
	19	10	12	14
	8	20	16	13
	8	17	18	15
	10	12	15	14
Mean:	17•4	18•3	17•0	16•1

Text:	3A	3B	4A	4B
	25	26	31	17
	20	27	26	12
	20	14	10	13
	22	14	17	26
	18	16	12	12
	16	21	11	18
	23	18	12	12
	18	17	14	21
	16	17	26	21
	22	15	12	30
	17	13	11	18
	17	24	20	17
	16	27	17	13
	14	18	13	17
	16	16	14	15
	26	9	16	13
	14	12	14	20
	17	19	20	17
	12	10	12	19
	19	16	16	9
	14	12	7	15
Mean:	18•1	17•1	15•2	16•9

EXPERIMENT 4(ii)

OPEN-ENDED QUESTIONS

Forrester (Paired Scores)

Text	1A	1B	2A	2B
	4	1	2	1
	3	4	5	1
	1	3	6	3
	3	2	1	3
	3	1	2	1
	3	3	6	2
	4	2	4	3
	2	1	4	2
	5	2	2	2
	2	1	6	3
	3	3	3	2
	2	1	2	1
	3	1	5	3
	3	2	3	1
	2	3	1	5
	3	1	3	2
	1	3	3	1
	4	2	1	2
	3	5	2	1
	2	1	1	1
	2	1	1	1
	1	1	1	1
	2	1	3	1
Mean:	2·65	1·9	2·9	1·9

Text:	3A	3B	4A	4B
	3	1	2	2
	0	2	2	2
	1	0	3	2•5
	0	1	2•5	3
	1	1	2•5	2
	0	1	2	3
	0	0	0	3
	2	1	2	3
	3	0	3	3
	2	0	0	1
	0	1	3	2
	0	3	4	2
	1	3	2	3
	0	1	2	2
	0	4	1	•5
	2	0	2	3
	0	2	2	1
	3	2	2	1
	1	2	2	1
	0	2	2	•5
	0	1	1	3
Mean:	0•9	1•3	2•0	2•0

APPENDIX 3

MARKING SCHEMES

EXPERIMENT 1 (TIME)

MARKING SCHEME FOR THE RECALL ANSWERS

The Recall answers constituted more or less bits of free writing, and any assessment of them had to be impressionistic to some degree. Verbatim recall had not been asked for. The marking scheme for each answer was based on the numbered sequences of statements into which the original texts had been analysed. For the first text (1A and 1B) the sequence was as follows:

1. There are two kinds of cave: earth ones and stone ones.
2. The earth caves are dug into the hillside.
3. You select a place where the earth seems to be of the right kind.
4. You smooth the hillside.
5. You (then) have a vertical face.
6. In doing this, you will see what the soil is like to work with.
7. You make a first hole of two by seven feet.
8. You dig in for roughly three feet.
9. You start enlarging.
10. As you dig, the kind of soil will show you how large you can make the cave.
11. The harder and closer the soil is, the larger you can make your cave, and vice versa.
12. You dig out your cave.
13. You polish the earth walls to make them smooth.
14. You plaster them with mud made of firm earth.
15. All this time you leave the outer wall untouched.
16. You use just the little opening that you made at the beginning.

17./

17. You finish the cave.

18. You open up this wall.

19. You (then) have a door and a window.

All the units above were included in the scheme, even though some units are outside the strict narrative framework, and each was assigned one mark. The marking was thus out of a total of 19.

A mark was assigned each time the subject was judged to have recalled the sense of one of the above units with reasonable accuracy. This naturally involves subjective judgements, but experience with later experiments has shown that the amount of agreement between experienced markers is very high. The marks were assigned to the units in isolation; that is, no marks were deducted if the sequence of the units was incorrect. Below is an example of the marking scheme in operation. Figures refer to units in the marking scheme which the subject is considered to have recalled successfully.

There are two kinds of caves, stone ones and earth ones.
1
To make the cave you have to smooth it so that you have a
4
vertical face. Then you dig inwards for three feet and
5 8
you start enlarging it. The kind of soil tells you what
9
it is like. Once you make the cave you smooth the walls
6 12 13
and plaster them with mud. The outside of the cave is left
14 15
alone and once you have done this you make a door and a
17
window.
19

This gets 12 marks. The awarding of point 17 might seem rather suspect.

The scheme for the second passage (Texts 2A and 2B) was similar. In this case the units were as follows:

1. The expedition arrived in Katmandu late in August.
2. They set up base camp on the mountain early in September.
3. Progress was quick.
4. Weather delayed the setting up of Camp 5 at 26,000 feet for several days.
5. Camp 5 was finally established on November 4.
6. From then one, the climbers worked in incredibly severe weather. } *
7. Temperatures were around -40°F. } *
8. Wind made every movement a struggle. } *
9. Climbers from the team of 11 were struggling to set up Camp 6 on the previously unclimbed S.W. face of Everest. **
10. Atrocious weather set in.
11. Weather forced the climb to be abandoned (2,028 feet short of the top).
12. The camp is the highest point that any climber has reached on the mountain in the autumn.
13. It was from Camp 6 that Hamish MacInnes and Dougal Haston were to have launched their attempt on the summit.
14. Furious winds made it impossible to keep the box-type tents in position.
15. Winds completely ruled out the possibility of climbing the hazardous 2,000 feet to the top.

16./

---

* Units 6, 7 and 8 of the marking scheme represent one rather complex unit of the original analysis which has been broken down for marking convenience.

** For Unit 9 the answers

'They reached Camp 6'
OR 'They couldn't establish Camp 6'

were also allowed, since the text is ambiguous on this point.

16. The extreme winds and persistent trouble with their tents forced the expedition to turn back yesterday.

Below is an example of the scheme in operation.

The British team arrive (1) in Katmandu in late August. Progress (3) was good until weather made it very hard to climb the 20,028 mountain. Finally on November 4 the Camp 5 (5) was set up. But once again bad weather didn't (6) make matters any better and they had to abandon the expedition (11) on Camp 6. Hamish MacInnes and Dougal Haston were going (13) to try to climb the south-west face of everest but the box tents would not stay (14) down with the bad weather and the expedition had to be (16) stopped the next day.

Total = 8.

EXPERIMENT 2 (SPACE)

MARKING OF RECALL TESTS

As in Experiment 1 the marking scheme was based on the prior analysis of both texts into units. The aim of the experiment was to measure the effect of organisation upon the effectiveness of descriptive writing. In the context, this mean physical description. Hence any unit in the text which referred to the function of a part of the object was left out of the marking scheme. Also left out were the opening sentences of each text, since in both cases they were introductory and common to each version of both Text 1 and Text 2.

Below are the marking schemes for both texts. Each unit was allocated one point. Points were awarded only if a predicate was assigned to its correct referent.

Marking Scheme for 'Chlamydomonas'.

1. The cell is usually egg-shaped.
2. One end of the cell is pointed.
3. Two protoplasmic tails (flagella) sprout from the pointed end of the cell.
4. The tails are very fine.
5. The tails wave.
6. The chloroplast is the most conspicuous object in the cell.
7. The chloroplast is large.
8. The chloroplast is green.
9. The form of the chloroplast varies.
10. The chloroplast is usually cup-shaped.
11. The chloroplast is situated at the hinder end of the cell.

12./

12. The chloroplast occupies more than half the cell.
13. The protoplasm occupies the remainder of the cell.
14. The protoplasm is living.
15. The protoplasm contains a nucleus.
16. The nucleus is usually partly hidden in the cup formed by the chloroplast.
17. On one side of the chloroplast there is usually a pyrenoid.
18. The pyrenoid is similar to those found in Spyrogyra.
19. Some species of Chlamydomonas have more than one pyrenoid.
20. Some species may even have more than one chloroplast.

20 marks.

Marking Scheme for 'The Reptile Egg.'

1. The egg contains a large amount of yolk.
2. The yolk is yellow.
3. The yolk is contained in a sac.
4. The sac is connected with the digestive tract.
5. The amnion is a membrane.
6. The amnion encloses a cavity.
7. The cavity is large.
8. The cavity is filled with liquid.
9. The amnion is attached to the skin of the embryo.
10. The cavity develops about the body of the embryo.
11. The chorion is connected to the amnion.
12. The chorion is a membrane.
13. The chorion lies beneath the shell.
14. The allantois is a tube and sac.
15. The allantois grows out from the back end of the embryo's body.

16./

16. The shell is on the exterior.

17. The shell is firm.

18. The shell is porous.

19. Blood vessels surround the allantois.

19 marks.

EXPERIMENT 3 (HYPOTACTIC AND PARATACTIC)

MARKING SCHEME FOR RECALL TESTS

(Each marking unit is numbered, the number being given in brackets after the unit.)

Figures in the left-hand margin refer to the sentences of each text. In each case, the referent (subject) is on the left and the predicate on the right.

Text 1A.

1.	City life (1)	may be more suitable for birds and other wild life (2)
		than we suppose (3)
2.	We (4)	tend to think of places like these (5)
		as composed of concrete and asphalt (6)
	Many of them (7)	contain a large amount of green space (8)
3.	The four large Royal parks (9)	embrace 1,308 acres (11)
	in London (10)	
4.	The Thames, the canals, the squares (12)	
	gardens and tree-lined streets (13)	you have = there are (14)
5.	All our bigger cities (15)	are much the same (16)
6.	They (17)	have a lot of concrete and brick development (18)
	they all (19)	have their allotments, commons, cemeteries (20)
		golf courses and railway embankments (21)
	which (22)	give almost as good cover (23)
		for animals and birds (24)
		as a country valley (25)

7.	Many birds (26)	seem to have more chance of survival (27)
		in a big city (28)
8.	Tests (29)	were carried out (30)
		on wild birds (31)
		living in London and in the country (32)
9.	The city birds (33)	were heavier (34)
		and generally fitter (35)

Total = 35 marks.

Text 1B

1.	The vast majority of people (1)	
	in this country (2)	live in cities or big towns (3)
2.	We (4)	tend to think of places like these (5)
		as composed of concrete and asphalt (6)
	many of them (7)	contain a large number of public parks (8)
3.	These (9)	provide a place of rest and relaxation (10)
		for thousands of workers (11)
4.	Squares, gardens, canals (12)	
	rivers and tree-lined streets (13)	(there) are, added to these (14)
5.	We (15)	can catch a glimpse of the country there (16)
6.	Parks and gardens (17)	are designed to look like the countryside (18)
	gravel pits, railway embankments (19)	
	golf courses and allotments (20)	also (there) are (21)
	wild flowers (22)	can grow there (23)
	small animals (24)	can live as comfortably as in the country (25)

7./

7. Some birds (26) are already more common in the cities (27) than they are in the country (28)

8. Foxes (29) have been observed (30) in the last few years (31) in the outskirts of London (32)

9. This migration (33) from country to town (34) is increasing (35)

Total = 35 marks.

Text 2A

1.	The Lopsong (1)	
	or Himalayan muntjak (2)	is an unusual animal (3)
2.	It (4)	is seldom to be found (5)
		in the company of its own kind (6)
		except during the brief mating season (7)
		when small herds are sometimes observed (8)
3.	The maountains (9)	
	on which this rare creature lives (10)	are so bare (11)
		that a territory is seldom able to sustain (12)
		more than one animal (13)
4.	The Lopsong(14)	seems to stay on the high Tibetan plateau (15)
		for most of the year (16)
	it (17)	only comes down to the Himalayan foothills (18)
		in June and July (19)
5.	Munningford (20)	
	the first European to see the Lopsong (21)	first reported spotting them (22)
		on low ground (23)
		as early as March (24)
6.	This (25)	was exceptional (26)
		even if he was correct (27)
	it (28)	was probably caused by bad weather (29)
		in the higher regions (30)
7.	Tibet (31)	is known to have experienced very severe storms (32)
		in 1873 (33)
		the year in which Munningford reported this observation (34).

Total = 34 marks.

Text 2B

1. The Lopsong (1)	
or Himalayan muntjak (2)	is an animal with a nomadic way of life (3)
2. It (4)	is seldom to be seen (5)
	in zoos in this country (6)
	with the exception of the zoo at Chilling (7)
	where three muntjaks can be observed (8)
3. The hairy coat (9)	
of this rare creature (10)	is so impenetrable (11)
	that on its home ground (12)
	it can withstand temperatures well below freezing point (13)
4. The Lopsong (14)	seems to stay on the high Tibetan plateau (15)
	for most of the year (16)
it (17)	comes down to the Himalayan foothills (18)
	in June and July (19)
5. Munningford (20)	
the first European to see the Lopsong (21)	first reported spotting them (22)
	in the far north of Nepal (23)
	early in 1873 (24)
6. He (25)	was suffering from fever (26)
	at the time (27)
He (28)	did not succeed (29)
	in getting really close on this occasion (30)
7. The first live specimen of the animal (31)	was captured by Munningford (32)
	in 1874 (33)
	and successfully shipped alive to England (34)

Total = 34 marks.

Text 3A

1. Nature	is adapting herself (2)
	among the noise and bustle of many of Britain's biggest cities and towns (3)
2. Many birds and animals (4)	
which once used to live only in the country (5)	are now settling in the towns (6)
3. Falcons, kestrels (7)	
magpies and owls (8)	are finding suburban life agrees with them (9)
4. Many birds (10)	make their way into towns and cities (11)
	via the motorways (12)
5. The big attraction (13)	is not the motorway itself (14)
	is the way in which it is constructed (15)
6. The steep grassy banks (16)	provide ideal breeding grounds for voles (17)
	which are the main diet of birds like the owl (18)
7. The birds (19)	don't have much difficulty finding food (20)
	when they arrive (21)
8. Tawny owls (22)	are finding that their natural prey - mice and voles - are plentiful (23)
	in the concrete jungle.

Total = 24 marks.

Text 3B

1. We (1)	often worry these days about the way (2)
	some animals are on the decrease in the country (3)
2. Many animals and birds (4)	
which once used to live only in the country (5)	are now settling in the towns (6)
3. Moorland plants (7)	
and insects (8)	also find that suburban life agrees with them (9)
4. Some birds (10)	are making their homes (11)
	on the sides of multi-storeyed flats (12)
5. The window ledges of empty tenements (13)	
and disused factories (14)	also provide suitable nesting places (15)
6. The nestlings (16)	regard the city as their natural home and hunting ground (17)
	when they grow up, far from the wilds (18)
7. Birds (19)	
that settle in big cities (20)	don't have much difficulty finding food (21)
8. They (22)	are also safer in town than in the countryside (23)
	from the dangers of pesticides, traps and gamekeepers' guns (24).

Total = 24 marks.

Text 4A

1.	Mann (1)	is easily the most promising candidate (2)
		in the forthcoming local elections (3)
2.	He (4)	has made some serious mistakes (5)
		in the campaign (6)
	which (7)	have raised doubts in some minds (8)
		as to his acceptability (9)
3.	To exercise perfect judgement (10)	
	in the heat of an election campaign (11)	is by no means easy (12)
	it (12)	is generally considered (13)
	Mann (14)	has made too many enemies for safety (15)
4.	His attack (18)	
	on the business community (19)	
	made last Thursday (20)	will almost certainly lose him (21)
		some much-needed campaign funds (22)
5.	Mann (23)	has still a far more original approach (24)
		to the problems of the area (25)
		than either of his two opponents (26)
		Marshon and Sellar (27)
		even if we admit this (28)
6.	Marshon (29)	has been content to mouth old slogans (30)
	Sellar (31)	seems to believe (32)
		that the fewer changes we make in anything the better (33)

Total = 33 marks.

Text 4B

1.	Mann (1)	is easily the most youthful candidate (2)
		in the forthcoming local elections (3)
2.	He (4)	has made many speeches (5)
	They (6)	cast grave doubts on the ability (7)
		of the present administration (8)
		to deal with problems of housing (9)
3.	To define Mann's exact political position with any accuracy (10)	is by no means easy (11)
	it (12)	is generally considered (13)
	Mann (14)	is more left wing than the man he intends to replace (15)
4.	Mann (16)	will address members of the business community (17)
		next Thursday (18)
		will certainly ask them for (19)
		some much-needed campaign contributions (20)
5.	Mann (21)	will still face some tough competition (22)
		from the other two candidates (23)
		Marshon and Sellar (24)
		both of whom have year's more experience (25)
		even if he succeeds in getting funds (26)
6.	Marshon (27)	is this time concentrating on public spending (28)
	Sellar (29)	is trying to gain people's support (30)
		for plans to build offices on the High Street (31).

Total = 31 marks.

Text 5A

1.	The facts about Jews (1)	are not well-known (2)
	(they) (3)	are worth summarizing (4)
2.	Less prejudice (5)	may be (6)
	much suffering (7)	may be averted (8)
		if more people are made aware of them (9)
3.	The Jews today (10)	cannot be said to form a nation, except in Israel (11)
4.	Jewish people (12)	belong to many different nations, including our own (13)
5.	They (14)	are not at all uniform in physical features (15)
6.	Not all Jews (16)	have the so-called 'Jewish nose' (17)
	lots of people who are not Jews (18)	do have noses like this (19)
7.	Many Jews (20)	are dark (21)
	a surprising number (22)	are red-headed (23)
8.	A widespread belief (24)	is that it is possible to identify Jews by their appearance (25)
9.	A very large number of errors (26)	are made (27)
		when this is put to the test (28)
10.	The people tested (29)	often fail to identify Jews as such (30)
	they (31)	identify as Jews people who are not Jews at all (32)
11.	They (33)	often identify Armenians as Jews (34).

Total = 34 marks.

Text 5B

1.	The facts about Jews (1)	are not well known (2)
	They (3)	are worth summarizing (4)
2.	The Jews (5)	were originally a tribe (6)
		or group of tribes (7)
		living in Palestine (8)
		were finally expelled from there by the Romans (9)
3.	The Jews today (10)	cannot be said to form a nation except in Israel (11)
4.	A sizeable number of citizens in that country (12)	are not Jewish (13)
5.	Jews (14)	are not at all uniform in religious beliefs (15)
6.	People (16)	think of Jews as mainly working in business (17)
	(because) Jews (18)	were often not allowed to own land (19)
7.	Most Jews (20)	live in the West (21)
	a surprising number (22)	are orientals (23)
8.	A widespread belief (24)	is that it is possible to identify Jews by their appearance (24)
9.	A very large number of errors (26)	are made (27)
		when this is put to the test (28)
10.	People in the past (29)	have accused the Jews (30)
		the Jews were responsible for all the misfortunes countries suffered (31)
		from wars to bad weather (32)
11.	These accusations (33)	are nowadays considered to be nonsense (34).

Total = 34 marks.

Text 6A

1.	The Eskimos (1)	live a pleasant life (2)
		during these months (3)
2.	The sun (4)	shines (5)
	the air (6)	is remarkably warm (7)
		in contrast to the permanently dark winter months (8)
3.	Food (9)	is more easily obtainable (10)
		at this time of year (11)
4.	Much of the ice (12)	melts (13)
		near the shore (14)
	shrubs (15)	appear (16)
		Providing berries for the children to collect (17)
5.	Herds of caribou (18)	move north (19)
		to browse on the low Arctic shrubs (20)
6.	Life (21)	is more hectic than in winter (22)
		if it is more agreeable (23)
7.	Many chores (24)	are done (25)
		in the dark winter months (26)
8.	The nets, harpoons and sledges (27)	are mended (28)
		at this time (29)
9.	The nets and harpoons (30)	are really put to use (31)
		in the summer (32)
10.	Hunting and fishing (33)	go on almost every day (34)
		and sometimes at night (35)
	food supplies (36)	can be collected and dried (37)
		before the winter (38)

Total = 38 marks.

Text 6B

1.	The Eskimos (1)	live in deerskin tents (2)
		during these months (3)
2.	The sun (4)	shines (5)
	the air (6)	is remarkably warm (7)
		in contrast to the permanently dark winter days (8)
3.	Food (9)	is more easily obtainable (10)
		at this time of the year (11)
4.	Much of the ice (12)	melts (13)
		near the shore (14)
	shrubs (15)	appear (16)
		making the shoreline colourful with their flowers (17)
5.	Clouds of mosquitoes (18)	rise and hover (19)
		above the pools of brackish water (20)
6.	The Arctic (21)	comes to life (22)
		for a period that is all too short (23)
7.	The Eskimos (24)	largely stay inside (25)
		in the dark winter months (26)
8.	Nets, harpoons and sledges (27)	are mended (28)
		at this time (29)
9.	The Eskimos (30)	spend most of their time in the open air (31)
		in the short summer months (32)
10.	Hunting and fishing (33)	go on almost every day (34)
		and sometimes at night (35)
	Food supplies (36)	can be collected and dried (37)
		before the winter (38)

Total = 38 marks.

EXPERIMENT 4

MARKING SCHEMES FOR RECALL TEXTS

1 mark was awarded for recall of each of the following statements:

Text 1.

1. A primary school teacher in London held an election in class to show the pupils how such things work.
2. The children in the class sat down with much pencil chewing to elect a Prime Minister, Foreign Secretary and Home Secretary.
3. When the teacher realized how things were going, she was appalled.
4. The three representatives elected were all of them white.
5. And they must have been elected purely because of their whiteness.
6. None of them were in any way natural leaders.
7. It's a striking story.
8. This class, in racial terms, was a good class.
9. There was little insecurity.
10. There was little feeling among the black children that they had to fit into a white framework.
11. Right from the beginning they painted themselves and their families brown or black in their drawings.
12. When it came down to picking out those most suited for authority, they chose the whites.

Text 2.

1. In selecting McRule to run for President, the Populist Party have chosen the wrong man.
2. McRule is far too radical for a country that would dearly like a period of peace and quiet.

3./

3. He has not shown himself ideally suited to the exacting demands of the Presidency.
4. His conduct over the vice-presidential candidacy of Senator Hawkins was ill-judged and inconsistent.
5. On the war in Ranasthan his policy is tantamount to simple surrender.
6. He has failed to take the initiative in the campaign itself.
7. Nullin has by no means been an ideal President.
8. He has almost ended Wallachian involvement in the Ranasthan war.
9. In other areas of policy he has concentrated on the popular and spectacular rather than on the unpopular but sound.
10. McRule's failings will probably cost him the election.

Text 3.

1. Mr. Gromyko, the Soviet Foreign Minister, has proposed that expenditure on defence should be cut by 10%.
2. And part of the saving used to assist the poorer nations.
3. The Soviet Union could manage a 10% cut.
4. It spends far more on its armed forces in Europe than is required for defensive purposes.
5. There is some difficulty in calculating exactly what the Soviet Union does spend on defence.
6. It tends to underestimate, or disguise, the total sum.
7. It has been estimated that it spends around 11% of its gross national product on defence.
8. From the Soviet point of view, this is a good year to make the proposal.
9. The previous arms build-up has been both excessive and expensive.
10. China is still far behind.
11. The Soviet Government's desire for an arms reduction deserves to be investigated.

Text 4./

Text 4.

1. Statistics of crime are very difficult to interpret.
2. This is clearly shown by the difficulties met with in the United States, with its mixed population.
3. Suppose that we compare the Irish and the Italians in America.
4. We can hardly hope to learn anything about the criminal tendencies of the Irish and the Italians in general.
5. The immigrants from the two countries may constitute two quite unrepresentative groups.
6. The best types of Italians might be reaching America, and the worst Irish, or vice versa.
7. It's no use comparing the figures for the Irish in Ireland with those for the Italians in Italy.
8. The comparison would be spoiled by differences in laws in the two countries.
9. Even in a single country, different groups may be treated differently.
10. Negroes in the United States (and especially in the south) are more likely to be arrested for criminal offences than whites.
11. Once arrested, they are more likely to be convicted than whites.

EXPERIMENT 4 (1)

MARKING SCHEME FOR RECALL SCRIPTS, TAKING ACCOUNT OF INTER-SENTENTENTIAL RELATIONSHIPS

Marks were awarded only for recall of pairs of statements, making clear the relationship between the two statements in the pair, either by linear ordering or by marking. No marks were awarded for either (a) recall of one member of a pair without the other, or (b) recall of both members in such a way as to make clear that the relationship had been lost.

Below are the statements in each text which entered into hypotactic relationships, together with the pairings for which marks were awarded.

Text 1.

1. The teacher was appalled.
2. The three children elected were all white.
3. They must have been elected because they were white.
4. None of them were natural leaders.
5. It's a striking story.
6. In racial terms, this was a good class.
7. There was little insecurity, little feeling among the black children that they had to fit into a white framework.
8. They painted themselves and their families brown or black.

Pairings: (a) 1 and 2
(b) 3 and 4
(c) 5 and 6
(d) 6 and 7
(e) 7 and 8.

Text 2/

Text 2.

1. The Populist Party have chosen the wrong man.
2. McRule is too radical.
3. He has not shown himself ideally suited to be President.
4. His conduct in the vice-presidential campaign was ill-judged and inconsistent.
5. His policy on the war was tantamount to simple surrender.
6. He has failed to take the initiative in the campaign.
7. Nullin is not an ideal President.
8. He has concentrated on the popular and spectacular.

Pairings: (a) 1 and 2 Or 1 and 4, or 1 and 5, or 1 and 6.
(b) 1 and 3
(c) 3 and 4
(d) 3 and 5
(e) 3 and 6
(f) 7 and 9

Text 3.

1. The Soviet Union could manage a 10% cut.
2. It spends more on its armed forces than is necessary.
3. It is difficult to calculate what it does spend.
4. It tends to underestimate the total sum.
5. From the Soviet point of view, this is a good year to make the proposal.
6. The previous arms build-up has been excessive and expensive.
7. China is still far behind.

Pairings: (a) 1 and 2
(b) 3 and 4
(c) 5 and 6
(d) 5 and 7.

Text 4/

Text 4.

1. We cannot say anything about the criminal tendencies of the Italians and Irish in general by comparing immigrants in America.
2. The two groups may be unrepresentative.
3. The best types of Italians may be reaching America and the worst Irish, or vice versa.
4. We cannot compare crime rates in Italy and Ireland.
5. The laws are different.
6. Groups may be treated differently in a single country.
7. Negroes in the USA are more likely to be arrested than whites.

Pairings: (a) 1 and 2 or 1 and 3

(b) 2 and 3

(c) 4 and 5

(d) 6 and 7.

APPENDIX 4

ITEM ANALYSIS ON RECALL SCRIPTS OF TEXTS 2 AND 5, EXPERIMENT 3.

ITEM ANALYSIS ON RECALL SCRIPTS OF TEXTS 2 AND 5, EXPERIMENT 3

In the first version of Experiment 3, 2 'paratactic' texts, 2B and 5B, proved significantly easier than the corresponding 'hypotactic' texts, 2A and 5A. However, because the content in each member of a pair of texts was not kept constant, it is possible that the experimental results were due to differences in context, rather than differences in organisation.

In order to examine this more carefully, an item analysis was carried out with the aim of (a) detecting which units of one text were easier than the corresponding units of the other text in a pair, and (b) discovering any common factor, other than organisation, which might have produced the differences. Results of this investigation are summarized below.

Only units whose facility rating differed by 20% or more from that of the corresponding unit of the other text in the pair are shown. Figures in brackets refer to units and facility ratings.

The explanations offered are extremely tentative. There was no clear evidence of any common factor, apart from organisation.

Lopsong - Facility Ratings Compared

Text A. is an animal with an unusual way of life (3) (78%)

B. is an animal with a nomadic way of life (3) (58%)

Explanation: 'unusual' more familiar than 'nomadic'?

A. it is seldom to be found (5) (70%)

B. it is seldom to be seen (5) (90%)

Explanation: ?

A. when small herds are sometimes observed (8) (33%)

B. when three muntjaks can be observed (8) (61%)

Explanation: ?

A./

Text A. (The Lopsong lives) on the mountains (10) (15%)

B. (The Lopsong's coat) is hairy (10) (58%)

Explanation: ?

A. (a territory is seldom able to sustain) more than one animal (13) (52%)

B. it can withstand temperatures well below freezing point (13) (84%)

Explanation: Might be that references to territory are more tenuously related to the topic and hence less easily remembered than facts about the Lopsong's coat.

A. on low ground (23) (48%)

B. in the far north of Nepal (23) (26%)

Explanation: Less familiar?

A. This (25)(19%) was exceptional (26) (19%)

B. He (25)(61%) was suffering from fever (26)(61%)

Explanation: (i) Concrete v abstract?

(ii) Modality v non-modality

(iii) Initial adjunct v initial main clause

(iv) Munningford here a sub-topic?

A. Tibet is known to have experienced very severe storms (32) (26%)

B. (The Lopsong) was captured by Munningford (32) (65%)

Explanation: Topic the Lopsong, not Tibet?

A. the year in which Munningford reported this observation (34) (30%)

B. and it was successfully shipped alive to England (34) (51%)

Explanation: Topic again the Lopsong, not the year of Munningford's observation?

Jews./

Jews - Facility Ratings Compared

Text A. It may well be that if more people are made aware of them (facts about Jews) (8)(59%) there will be (5)(50%) less prejudice (4)(58%) and much suffering (6)(35%) may be averted (7)(31%).

B. The Jews (4)(97%) were originally a tribe (5)(83%), or group of tribes (6)(76%), living in Palestine (7)(76%) but they were finally expelled from there by the Romans (8)(93%).

Explanation: (i) Modality A - may be ... will be ... may be ...

V. B - factual past tense throughout.

(ii) Abstract v. concrete:

A - awareness of facts - less prejudice - much suffering

v. B - tribe ... group of tribes ... Palestine ...

(doubtful where 'prejudice' is more abstract than 'tribe')

(iii) A has a lot of different subjects; people, prejudice, suffering. None of them relate directly to the Jews, the 'topic' of the text.

B has one subject: 'Jews' - were a tribe
- group of tribes
- lived in Palestine
- were expelled.

Text A. Jewish people (11)(65%) belong to many different nations, including our own (12)(65%).

B. And even in that country (Israel), a sizeable number of citizens (11)(35%) are not Jewish (12)(35%).

Explanation:/

Explanation: (i) A. positive, B. negative.

(ii) A. subject = 'Jewish people', i.e. the subject.

B. subject = 'a sizeable number of citizens of Israel', i.e. not subject.

(iii) B. starts with adjunct, 'Even in that country ...'

Text A. A surprising number (21)(85%) are red-headed (22)(85%)

B. A surprising number (21)(41%) are orientals (22)(41%)

Explanation: (i) 'red-headed' more familiar than 'oriental'?

(ii) Preceding text read - A. 'Many Jews are dark.' This legitimately taken as - dark-haired. Hence 'topic' = hair-colour. Hair-colour = dark. But hair-colour = red-headed. On the other hand, the preceding text in B. read 'many Jews live in the West.' It may be that subjects failed to construct common topic 'Jews' living-places', and therefore missed parallelism. This, if the analysis is correct, could be altered by making B. read: 'Most Jews live in the West but a surprising number live in the Orient.'

Text A. The people tested (28)(19%) often fail to identiy Jews as such (29)(8%) and they may identify as Jews people who are not Jews at all (30)(15%).

B. In the past (28)(72%) people have accused the Jews (29)(72%) of being responsible for all the misfortunes that countries have suffered, from wars to bad weather (30)(69%).

Explanation: (i) A. is grammatically co-ordinate. Possible to get 28 and either 29 or 30.

In B., highly likely that if subject got 28 and 29, he would get 30 as well.

(ii)/

(ii) Marking scheme insisted on A. subjects getting 'the people tested', not just 'people'. In B, subjects could say 'people blamed ...' (past tense) and get their mark.

(iii) On a thoroughly informal level, A. seems more complex than B., viz. 'people who were Jews were not identified as Jews, and people who were not Jews were identified as Jews' - a bit of a tangle.

(iv) Topic in A. shifts to 'the people in the test' and their behaviour. In B., the topic is closer to 'Jews' - viz. 'they were blamed ...'

No explanation for:

'facts are worth summarising' (3) A = 46%, B = 62%

'a very large number of errors are made' (25,26). A = 42% and 42%
B = 69% and 69%

APPENDIX 5

ADDITIONAL SCRIPTS, EXPERIMENTS 3 AND 4

EXPERIMENT 3.

(Identical items in each pair are underlined.)

1A. A Life in the City.

City life may be more suitable for birds and other wild-life than we suppose. We tend to think of towns and cities as composed of concrete and asphalt, but many of them contain a large amount of green space. In London, for example, the four large royal parks embrace 1,308 acres. Then you have the Thames, the canals, the squares, gardens and tree-lined streets. It's much the same for all our bigger cities. They do have a lot of concrete and brick development, but they all have their allotments, commons, cemeteries, golf courses and railway embankments which give almost as good cover for animals and birds as a country valley. In fact, many birds seem to have more chance of survival in a big city. Tests were carried out on wild birds living in London and in the country. The city birds were heavier and generally fitter.

1B.

In this country the vast majority of people live in cities or big towns. We tend to think of places like these as composed of concrete and asphalt, but many of them contain a large number of public parks. These provide a place of rest and relaxation for thousands of workers. Added to these there are often squares, gardens, canals, rivers and tree-lined streets. There we can catch a glimpse of the country. Parks and gardens are designed to look like the countryside, but there are also gravel pits, railway embankments, golf courses and allotments where wild flowers can grow and small animals live as comfortably as in the country. Already some birds are more common in the cities than they are in the country.

In/

In the last few years, foxes have been observed in the outskirts of London. This migration from country to town is increasing.

Words 147. Average to a sentence 16·3. Sentences 9.

% of words of over 2 syllables 7·8.

Fog = 9.

The Lopsong

2A.

The Lopsong, or Himalayan muntjak, is an animal with an unusual way of life. It is seldom to be found in the company of its own kind, except during the brief mating season, when small herds are sometimes observed. The mountains on which this rare creature lives are so bare that a territory is seldom able to sustain more than one animal. For most of the year the Lopsong appears to stay on the high Tibetan plateau, only coming down to the Himalayan foothills in June and July. It's true that Munningford, the first European to see the Lopsong, reported spotting them on low ground as early as March. Even if he was correct, however, this was exceptional, and was probably caused by bad weather in the high regions. In 1873, the year in which Munningford reported this observation, Tibet is known to have experienced very severe storms.

2B.

The Lopsong, or Himalayan muntjak, is an animal with a nomadic way of life. It is seldom to be seen in zoos in this country with the exception of the zoo at Chilling, where three muntjaks can be observed. The hairy coat of this rare creature is so impenetrable that on its home ground it can withstand temperatures well below freezing point. For most of the year the Lopsong appears to stay on the high Tibetan plateau, only coming down to the Himalayan foothills in June and July. Munningford, the first European to see the Lopsong, first reported spotting them in the far north of Nepal early in 1873. He was, however, suffering from fever at the time, and did not succeed in getting really close on this occasion. In 1874, the first live specimen of the animal was captured by Munningford, and successfully shipped alive to England.

Words, 143. Sentences, 7. Average, 20. Words over 2 syllables, 17. = 12%

Fog = 14.

Birds in Cities

3A.

Among the noise and bustle of many of Britain's biggest cities and towns, nature is adapting herself. Many birds and animals which once used to live only in the countryside are now settling in the towns. Falcons, kestrels, magpies and owls are finding suburban life agrees with them. Many birds make their way into towns and cities via the motorways. The big attraction is not the motorway itself but the way it is constructed. The steep, grassy banks provide ideal breeding grounds for voles, which are the main diet of birds like the owl. And once the birds arrive, they don't have much difficulty catching food. Tawny owls, for example, are finding that their natural prey - mice and voles - are plentiful in the concrete jungles.

3B.

These days we often worry about the way some animals are on the decrease in the country. But many animals and birds which used to live only in the countryside are now settling in the towns. Moorland plants and insects also find that suburban life agrees with them. Some birds are making their homes on the sides of multi-storeyed flats. The window ledges of empty tenements and disused factories also provide suitable nesting places. When the nestlings grow up, far from the wilds, they regard the city as their natural home and hunting ground. Birds that settle in big cities don't have much difficulty finding food. They are also safer in town than in the countryside from the dangers of pesticides, traps and gamekeepers' guns.

Words, 125. Sentences, 8. Average, 15·6. Words over 2 syllables, 13 = 10·4%

Fog = 10·4

4A.

Mann is much the most promising candidate in the forthcoming local elections. Admittedly he has made some serious mistakes in the campaign which have raised doubts in some minds as to his acceptability. It's by no means easy to exercise perfect judgement in the heat of an election campaign, but it's generally considered that Mann has made rather too many enemies for safety. For example, his attack on the business community made last Thursday will almost certainly lose him some much-needed campaign funds. But even if we admit this, Mann has still a far more original approach to the problems of the area than either of his two opponents, Marshon and Sellar. Marshon has been content to mouth old slogans, while Sellar's main belief seems to be that the fewer changes we make in anything the better.

4B.

Mann is easily the most youthful candidate in the forthcoming local elections. He has made many speeches casting grave doubts on the ability of the present administration to deal with problems of housing. It's by no means easy to define Mann's exact political position with any accuracy but it's generally considered that he's more left wing than the man he intends to replace. Next Thursday he will address members of the business community and will certainly asktthem for some much-needed campaign contributions. Even if he succeeds in getting them, Mann will still face some tough competition from the other two candidates, Marshon and Sellar, both of whom have years' more experience. Marshon is this time concentrating on public spending, while Sellar is trying to gain people's support for plans to build offices on the High Street.

Words, 137. Sentences, 6. Average, 23. Words over 2 syllables, 26 = 19%

Fog = 15.

Summer in the Arctic

6A.

During these months, the Eskimos live a pleasant life. In contrast to the permanently dark winter days, the sun shines and the air is remarkably warm. Food is more easily obtainable at this time of the year. Near the shore much of the ice melts, and shrubs appear, providing berries for the children to collect. Herds of caribou move north to browse on the low Arctic shrubs. But if life is agreeable, it is also more hectic than in winter. Admittedly many chores are done in the dark winter months. This is the time when the nets, harpoons and sledges are mended. But it's in the summer that the nets and harpoons are really put to use. Hunting and fishing go on almost every day and sometimes at night, so that meat supplies can be collected and dried before the winter.

6B.

During these months the Eskimos live in deer-skin tents. In contrast to the permanently dark winter days, the sun shines and the air is remarkably warm. Food is more easily obtainable at this time of the year. Near the shore much of the ice melts and shrubs appear, making the shoreline colourful with their flowers. Clouds of mosquitoes rise and hover above the pools of brackish water. For a period that is all too short the Arctic comes to life. In the dark winter months the Eskimos largely stay inside. This is the time when the nets, harpoons and sledges are mended. In the short summer months, they spend most of their time in the open air. Hunting and fishing go on almost every day, and sometimes at night, so that meat supplies can be collected and dried before the winter.

Words, 141. Sentences, 10. Average, 14. Words over 2 syllables, 10. = 7%

Fog = 8•4

EXPERIMENT 4

UNMARKED TEXTS

1B.

A primary school teacher in London held an election in class to show the pupils how such things work. The children in the class - thirty black and four white - sat down with much pencil chewing to elect a Prime Minister, Foreign Secretary and Home Secretary. When the teacher realized how things were going, she was appalled. The three representatives elected were all of them white. And they must have been elected purely because of their whiteness: none of them were in any way natural leaders. It's a striking story: this class, in racial terms, is a good class. There was little insecurity, little feeling among the black children that they had to fit into a white framework. Right from the very beginning they painted themselves and their families brown or black in their drawings. Yet when it came down to picking out those most suited for authority, they chose the whites. What do you do in order to prevent this sort of situation?

2B.

We must conclude that in selecting McRule to run for President the Populist Party have this year chosen the wrong man. McRule is far too radical for a country that would dearly like a period of peace and quiet. But apart from that, he has not shown himself ideally suited to the exacting demands of the Presidency. His conduct over the vice-presidential candidacy of Senator Hawkham was ill-judged and inconsistent. On the war in Ranasthan his policy is tantamount to simple surrender. He has failed to take the initiative in the campaign itself. But Nullin has by no means been an ideal President either. It is to his credit that he has almost ended Wallachian involvement in the Ranasthan war, but in no other areas of policy he has concentrated on the popular and spectacular rather than on the unpopular but sound. Nevertheless McRule's failingswill probably cost him the election. Who can say whether this will prove to be a good thing for Wallachia?

3B.

Mr. Gromyko, the Soviet Foreign Minister, has proposed that international expenditure on defence should be cut by ten per cent and part of the saving used to assist the poorer nations. Certainly the Soviet Union could manage a ten per cent cut. It spends far more on its armed forces in Europe than is required for defensive purposes. There is, of course, some difficulty in calculating exactly what the Soviet Union does spend on defence. It tends to underestimate, or disguise the total sum. However, it has been estimated that it spends around eleven per cent of its gross national product on defence. From the Soviet point of view, this is a good year in which to make the proposal. The previous arms build-up has been both excessive and expensive, and China is still far behind. Still, the Soviet Government's desire for an arms reduction deserves to be investigated. Can any offer of a decrease in spending on weapons be ignored?

4B.

Statistics of crime are very difficult to interpret. This is clearly shown by the difficulties met with in the United States, with its mixed population. Suppose that we compare the Irish and the Italians in America. We can hardly hope to learn about the criminal tendencies of the Irish and the Italians in general. The immigrants from the two countries may constitute two quite unrepresentative groups. The best types of Italian might be reaching America and the worst Irish, or vice versa. On the other hand, it's no use comparing the figures for the Irish in Ireland with those for the Italians in Italy. The comparison would be spoiled by differences in laws in the two countries. Even in a single country, different groups may be treated differently. It is a commonplace that Negroes in the United States (and especially in the south) are more likely to be arrested for criminal offences, and, once arrested, more likely to be convicted, than whites. We shall be returning to a discussion of this problem later on.